

Rock Products and BUILDING MATERIALS

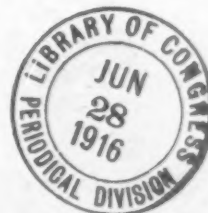
INCORPORATING DEALERS BUILDING MATERIAL RECORD

Volume XVIII.

CHICAGO, ILL., JUNE 22, 1916.

Number 4

What do you know about
Metal Lath?



When the architect, building contractor or owner discusses metal lath construction with you, what do you say? Do you know comparative costs, values, etc? Or, if these men never ask you for such information, why don't you go after them and tell them about the value of metal lath construction? It will mean more volume and profit to your sales department.

Let Us Co-operate with You

in informing the individuals of your locality on the value of metal lath construction. We will either send the data, etc., to you, or if you will send us your list, we will mail them direct. We have an expanded metal lath for every kind of work, interior or exterior. If you have not received a copy of our big new Kno-Burn catalog write for it now. Just ask for book No. 293

Manufacturers of
Kno-Burn, Eureka,
XX Century, Pure
Iron, Kno-Fur, Dia-
mond Mesh and
Chanelath

North Western Expanded Metal Co.
929 Old Colony Building
CHICAGO, ILL.

Giant BELT for Your Drives
Granite BELT for Your Elevators
Supremo BELT for Your Conveyors

WHY? ASK US.

Revere Rubber Co.

BOSTON NEW YORK CHICAGO NEW ORLEANS PHILADELPHIA

Clinchfield Portland Cement Corporation

General Office and Mills:
 Kingsport, Tenn.

*Strong
&
Sound*



*Fine
&
Uniform*

"The Acknowledged New Standard of the South"

**Annual Capacity
1,500,000 Barrels**

Sales Offices:
 KINGSFORT, TENN.

1305 Union Trust Bldg. 908 Com'l Bank Bldg. 413-15 Am. B'k & Tr. Bldg.
 CINCINNATI, OHIO CHARLOTTE, N. C. SAVANNAH, GA.



"PENNSYLVANIA"

Hammer Crushers For Crushing and Pulverizing Lime
 Limestone, Gypsum, Marl, Shale, Etc.
 Main Frame of Steel "Ball and Socket" Self-aligning Bearings;
 forged Steel Shaft; Steel Wear Liners; Cage adjustable by hand
 wheel while Crusher is running.
 No other hammer Crusher has such a big Safety Factor.

Pennsylvania Crusher Co.

New York PHILADELPHIA Pittsburg

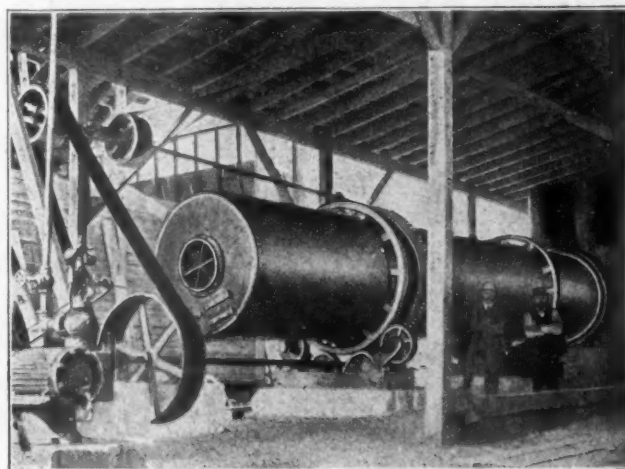
Patented

CONSISTENT ADVERTISING
 UNLIKE THE PROVERBIAL ROLLING STONE
GATHERS MOSS

RUGGLES-COLES DRYERS

STATIONARY AND PORTABLE

"Built to Dry at the Lowest Ultimate Cost"



Seven different types of dryers in many sizes and
 special dryers designed and built to meet unusual con-
 ditions. We are now drying 67 kinds of materials,
 among them sand, rock, gravel, gypsum, coal, clay, etc.

Our many years of experience is at your service

Ruggles-Coles Engineering Co.

MAIN OFFICE AND WORKS, YORK, PA.

Western Branch—McCormick Bldg. Chicago Eastern Branch—50 Church St., N. Y. City
 London Branch—Electro-Metals, Ltd., Imperial Bldgs., 56 Kingsway, W. C., London, Eng.

Daily Capacity
 9000 Barrels



Quality
 Quantity
 Service

MORE THAN FIFTEEN YEARS OF SATISFACTION

FOUR PLANTS:
 ALPENA, DETROIT, WYANDOTTE and CLEVELAND

HURON and WYANDOTTE

Great Water and Rail Facilities
 Best Serve the Entire Middle West

EVERY BARREL TESTED AND GUARANTEED
 SOLD BY THE BEST DEALERS USED BY THE BEST BUILDERS

Main Offices: 1525 Ford Building, Detroit, Mich.

Daily Capacity
 9000 Barrels



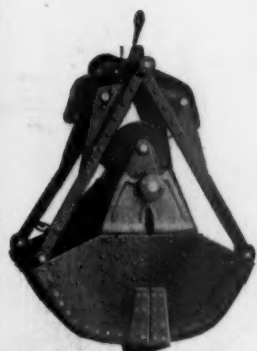
Quality
 Quantity
 Service

Tell 'em you saw it in ROCK PRODUCTS AND BUILDING MATERIALS



STANDARD QUARRY EQUIPMENT

An experience of 18 years in the design and manufacture of quarry equipment is built into the following extensive list.



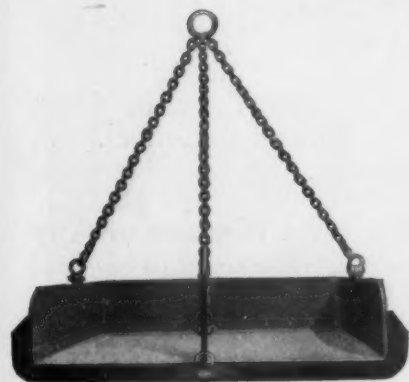
Lakewood Clam Shell Bucket

Bin Gates
Blast Furnace Skip Cars
Bottom Dump Cars
Buckets
Cement Block Cars
Electric Transfers
End Dump Cars
Frog and Switch Points
Gable Bottom Cars
Hopper Cars
Incline Cars
Mine Cars
One-side Dump Cars
Platform Cars
Portable Track

Quarry Cars
Radial Gate Hopper Cars
Rocker Dump Cars
Rotary Mine Cars
Rotary Scoop Cars
Side Dump Cars
Slip Cars
Stone Skips
Stone Sleds
Switches
Tipple Dump Cars
Transfers
Two-way Dump Cars
"V" Dump Cars
"V" Dump Wagon



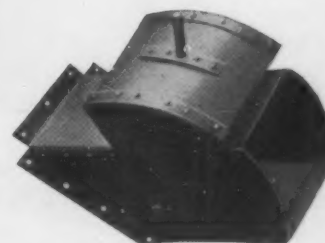
Lakewood Quarry Car No. 241



Lakewood Stone Skip, No. 680

We maintain a Consulting Engineering Department which is at the service of the trade, to offer suggestions on any problem of quarry operation.

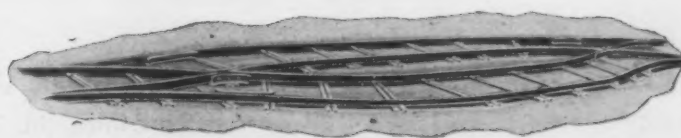
The Lakewood Line—Built to Last



Lakewood Bin Gates, No. 715

THE LAKEWOOD ENGINEERING CO.

CLEVELAND



Lakewood Portable Track and Switches

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MAXECON

Means MAXimum of ECONomy

Years of experience with the assistance of our hundreds of customers has found THE SOLUTION OF GRINDING HARD MATERIALS. The MAXECON PULVERIZER combines highest EFFICIENCY, greatest DURABILITY and assured RELIABILITY, Uses the LEAST HORSE POWER per capacity. Embodies the features of our Kent Mill with improvements that make it MAXECON.

WE DO NOT CLAIM ALL of the CREDIT for this achievement

We have enjoyed the valuable suggestions of the engineers of the Universal Portland Cement Co. (U. S. Steel Corp.), Sandusky P. C. Co., Chicago Portland C. Co., Marquette Cement Mfg. Co., Western P. C. Co., Cowham Engineering Co., Ironton P. C. Co., Alpena P. C. Co., Castalia P. C. Co., Pennsylvania P. C. Co., and many other patrons.

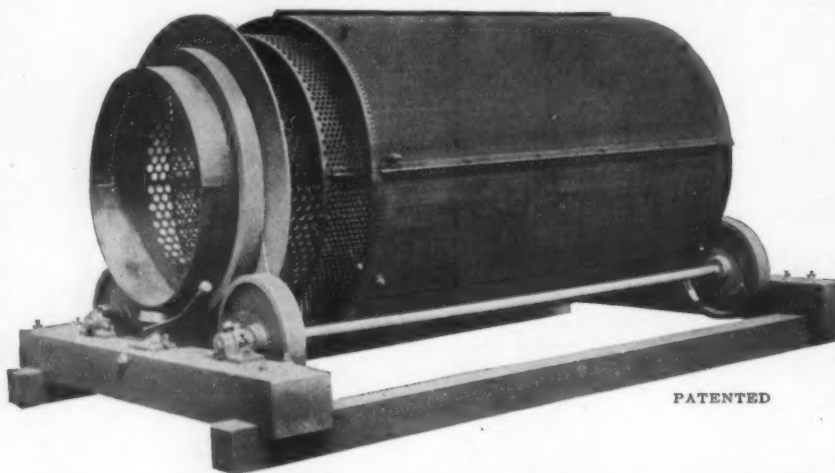
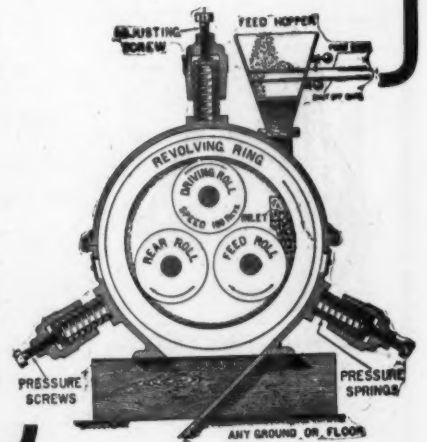
THE RING WOBBLER

The FREE WOBBLING POUNDING RING instantly and Automatically ADAPTS its position to the variations of work.

Its GRINDING ACTION is DIFFERENT than any other; besides the STRAIGHT rolling action of the rolls, the SIDE to SIDE motion of the ring makes the material subject to TWO crushing forces and DOUBLE OUTPUT results.

KENT MILL CO.

18 RAPELVEA ST., BOROUGH OF BROOKLYN, N. Y. CITY
LONDON, W. C., 31 HIGH HOLBORN
BERLIN-HOHENSCHOENHAUSEN



PATENTED

Johnston & Chapman Co.
2921 Carroll Avenue, CHICAGO

For Dry Screening Gravel
we make the most up-to-date machine on the market. Simple and Inexpensive.

A New Jacketed Type of Cone Screen for Washing Gravel. A Perfect Screen.

Complete Gravel Washers of Any Size. Successfully used in several of the largest gravel plants in the United States.

Another of Our Products that Can't be Beat

The O'Laughlin Screen

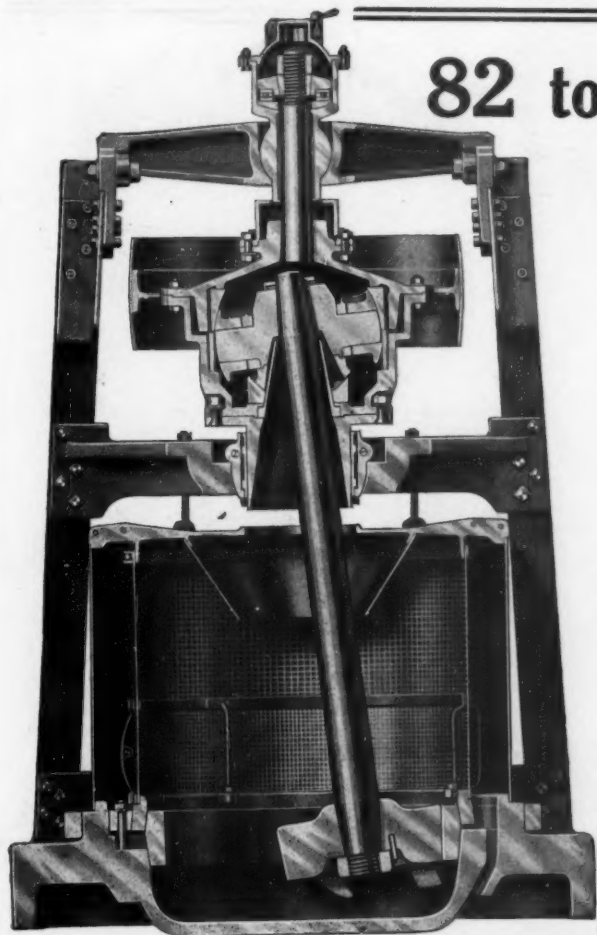
for Crushed Stone
See Illustration

SCREEN SECTIONS for ALL SIZES of REVOLVING SCREENS

CONICAL SCREEN SHELLS
FOR GRAVEL WASHING PLANTS

Everything in Screens Made Right, for
Crushed Stone, Gravel, Sand, Clay, Ore, Etc.

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82 to 83% Through 200 Mesh

Is Easily and Economically Produced

by the

GIANT GRIFFIN MILL

With Latest Improvements

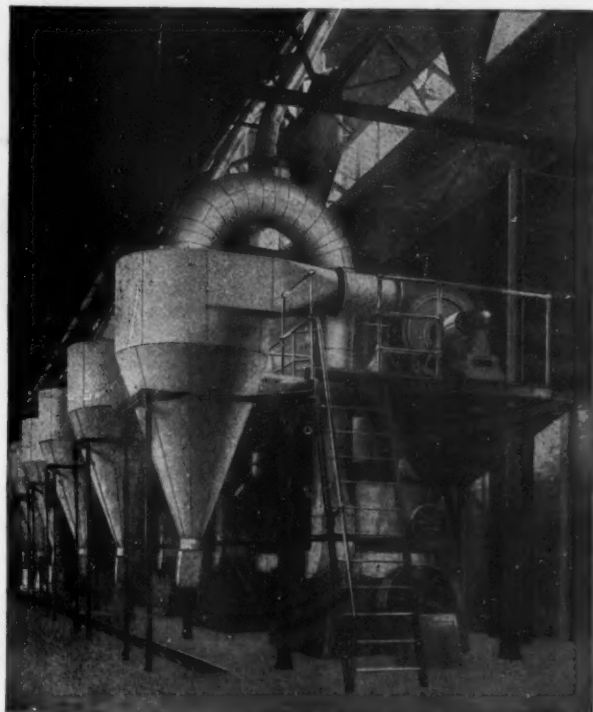
The Griffin Mill has always produced the fineness required and can now meet the new specifications, grinding clinker to a fineness of 82-83% through the 200 mesh sieve at lower cost than any other type of pulverizer or combination of pulverizers

Send for blue prints, descriptive matter, etc., showing our latest model Giant Griffin Mill. It is built to meet the new specifications.

BRADLEY PULVERIZER COMPANY

BOSTON, MASS.

WORKS—ALLENTOWN, PA.



Raymond System as installed in a Cement Plant for grinding raw material or coal

We design special machinery and methods for Pulverizing, Grinding, Separating and Conveying all powdered products. We manufacture Automatic Pulverizers, Roller Mills, Vacuum Air Separators, Crushers, Special Exhaust Fans and Dust Collectors.

Send for Our Literature

The Economy of Pulverizing Materials

by the

RAYMOND PULVERIZING AIR SEPARATING SYSTEM

has been proven by 400 plants which are reducing more than 100 materials of widely varying character.

Many of these concerns who were originally in doubt as to the adaptability of the Raymond System to their special grinding problem have, after a thorough trial, been unconditionally convinced of the economies produced by this system in their grinding departments.

The Raymond System produces these economies in many and various ways, the most striking of which is the elimination of expensive screening, elevating and conveying machinery. This is accomplished by using air-separation instead of screens to produce the fineness; at the same time, without any extra power, this air delivers the finished product direct to the next point of operation or storage.

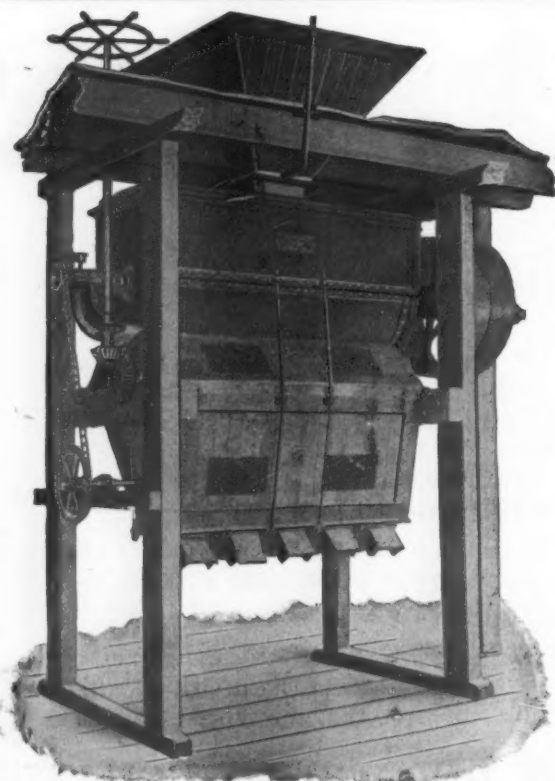
This reduces the amount of labor and repairs required with other methods of grinding and at the same time produces a greater capacity per horse power and a finer, more uniform product than any other method.

Wouldn't it be worth your while to investigate the possibilities of the Raymond System in your grinding department?

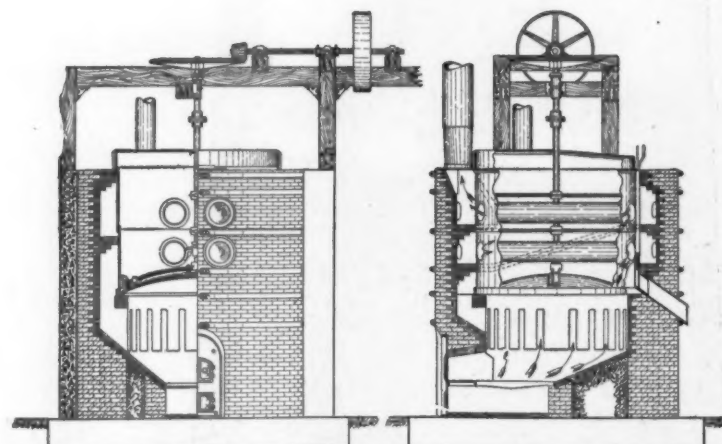
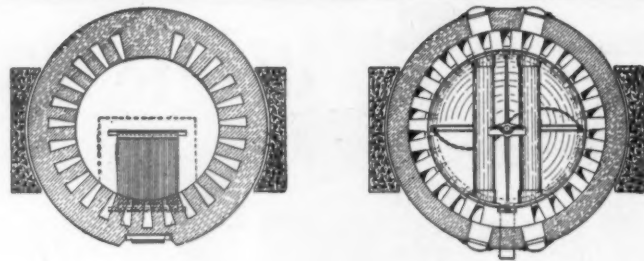
RAYMOND BROS. IMPACT PULVERIZER CO.

1301 North Branch St., Chicago, Ill.

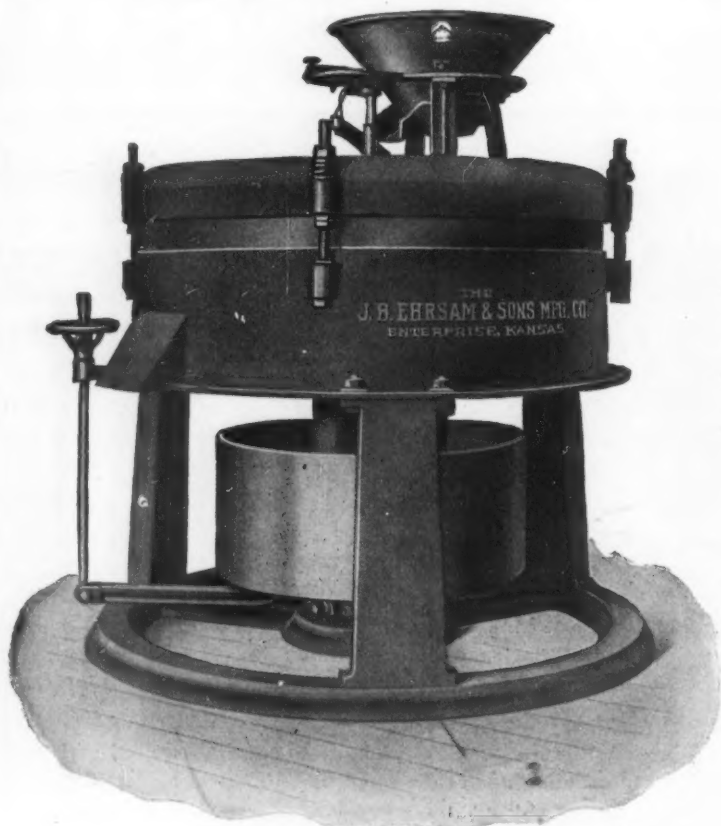
Tell 'em you saw it in ROCK PRODUCTS AND BUILDING MATERIALS



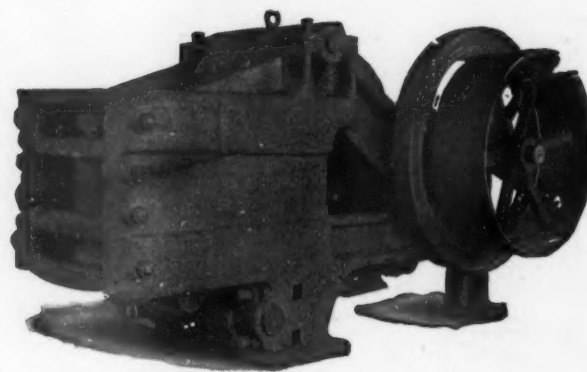
Enterprise Noiseless Mixer



Ehram Calcining Kettles—Built in 5 sizes—6-8-10-12-14 feet in diameter, having capacity of from 3 tons to 20 tons to the charge



Horizontal and Vertical Heavy Duty Grinding Mills

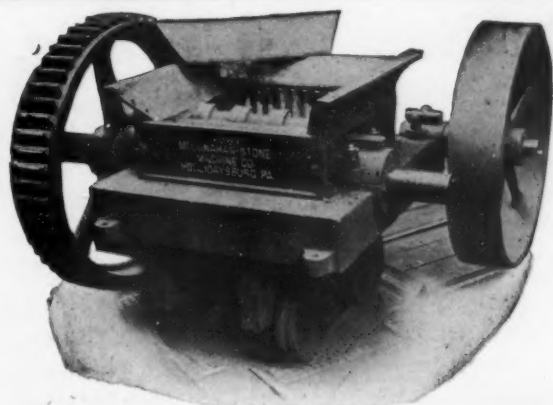


Jaw Crushers Built in all sizes up to 24" x 34" jaw opening. Rotary Fine Crushers in sizes up to 42" inside diameter.

The J. B. Ehram & Sons Mfg. Co., ENTERPRISE, KANSAS

Manufacturers of Plaster Mill Machinery, Conveying, Elevating and Power Transmission Appliances

Tell 'em you saw it in ROCK PRODUCTS AND BUILDING MATERIALS



OUR SINGLE ROLL CRUSHER IS AS SIMPLE AS CAN BE

Is easily fed, makes less fines than either a Gyratory or Jaw. Capacity 5 to 500 tons per hour. For crushing Limestone, Dolomite, Hard Rock, Phosphate, Cinders, Etc. Screens of all descriptions. Washers for dirty stone.

Ask for Information

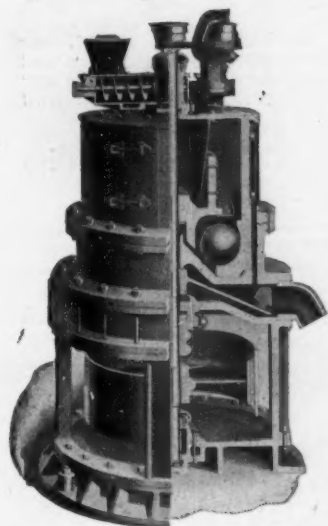
McLANAHAN-STONE MACHINE CO., Hollidaysburg, Pa.

**BACON & FARREL
ORE & ROCK
CRUSHING & WORLD KNOWN
ROLLS-CRUSHERS**
EARLE C. BACON, ENGINEER
HAYMEYER BUILDING, NEW YORK

The Fuller-Lehigh Pulverizer Mill

A Complete Self-Contained Unit

The most economical mill for producing
Agricultural Limestone



Reduces lump rock to
20, 40, 60, 80, 100,
or 200 mesh.
Requires no outside ac-
cessory equipment.
Requires no overhead
shafts, drives or
screens.
All material discharged
from mill is finished
product.
No inside journals or
bearings.
No inside lubrication.
Uniform feeding sys-
tem.
Constant and free dis-
charge.
Low installation cost.
Low operating cost.
Low lubricating cost.
Dustless operation.

Built in sizes to meet the requirements of your trade. Grinds rock to meet the specifications of all Agricultural Experiment Stations.

SEND FOR CATALOG NO. 70

Lehigh Car, Wheel & Axle Works

Main Office and Works:

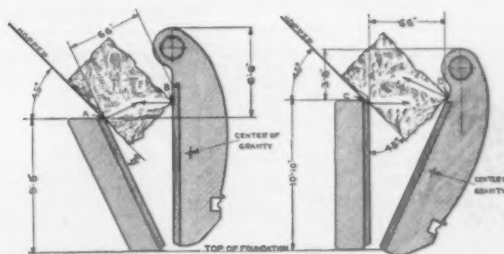
Catasauqua, Penna.

The Success of A. C. Steel Frame 84"x66" Jaw Crusher Is Due to Its Improved Design

Embodying the

Vertical Swing Jaw

As Illustrated by a Comparison of Receiving
Openings, Inclined Versus Vertical Swing Jaw



Sketch No. 1:
Allis-Chalmers Vertical Swing Jaw

Sketch No. 2:
Old Inclined Swing Jaw

Improvements in Feeding

Sketch No. 1 shows a block of stone 4'-6"x6'-6", as it would naturally be delivered to the crusher. Note that the stone strikes the moving jaw at a point considerably below the fulcrum point and within the crushing zone. A stone in this position will be crushed, or positively forced into the crusher as the reaction from the surfaces at points A and B intersect each other, thereby preventing any tendency to lift the stone out of the crusher.

Referring to Sketch No. 2, where a block of stone of the same size is shown, note that the stone strikes the moving jaw near the fulcrum point, where there is little motion, entirely outside of the crushing zone, and above the jaw plates. A stone in this position will not be crushed, as the reaction from the surfaces at points C and D do not intersect, and the tendency of these forces is to lift the stone out of the crusher.

In Sketch No. 1 the stone has to turn only 20 degrees to rest flat against the stationary jaw, while in Sketch No. 2 the stone must turn 45 degrees to take the same position.

Note the difference in height of the two types of crusher, measuring from top of foundation to top of stationary jaw plate. Also note that with construction shown in Sketch No. 1 there is much less chance for material to jump over top of the moving jaw.

Improvements in Operating

When taking up wear of jaw plate or inserting new plates, both back and front toggles as well as the shims behind toggles block are readily freed on account of the tendency of the vertical swing jaw (Sketch No. 1) and of the pitman to swing forward because their center of gravity is located behind their respective point of support.

This is an important operating feature considering the great weight of the affected parts.

SMALLER JAW CRUSHERS DOWN TO LABORATORY SIZE

**Complete Rock Crushing Plants
and Cement Mills—Power Plants—
Electric Motors—Gates Gyratory Breakers**

**Allis-Chalmers
Manufacturing Company**

OFFICES IN ALL PRINCIPAL CITIES

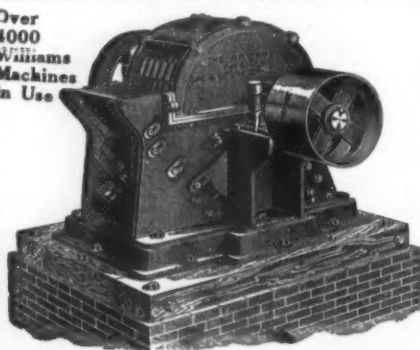
MILWAUKEE,

WISCONSIN

For All Canadian Business
Refer to Canadian Allis-Chalmers, Ltd., Toronto, Ont.
FOREIGN REPRESENTATIVE—Chile and Bolivia: Mark R. Lamb, Huerfano 1157, Casilla 2683, Santiago, Chile. Europe, East Indies, etc.: H. I. Keen, 782 Salisbury House, London Wall, London, England. South Africa: Herbert Ainsworth, P. O. Box 8659, Johannesburg, South Africa. Australia: Frank R. Perrot, 683 Hay St., Perth, W. A., and 204 Clarence St., Sydney, N. S. W. South America, China, Philippine Islands, Japan: American Trading Co.

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Over
4000
Williams
Machines
In Use



Lump Lime Crushers and Grinders

We specialize in extra heavy crushers for lump lime—for hydrating or for agricultural work

SPECIFICATIONS

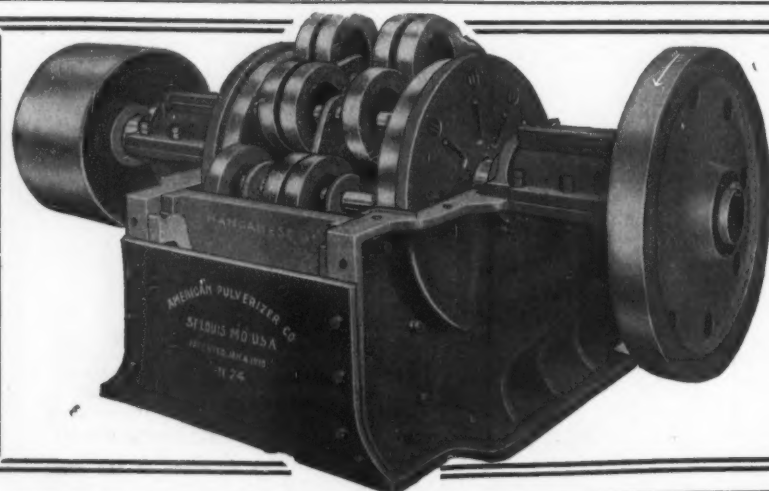
SIZE	WEIGHT	CAPACITY TONS HOUR TO 4"	CAPACITY TONS HOUR 6 MESH.	H. P.
No. 1	7000 lbs.	8-10	6-8	20-25
No. 2	8500 lbs.	10-15	8-10	30-35
No. 3	12000 lbs.	15-18	12-15	40-50

A FEW USERS
Kelly Island and Lime Co.
National Lime & Stone Co.
U. S. Gypsum Co.
Tidewater Pt. Cement Co.

ALSO MADE IN SIX LARGER SIZES — WE ALSO MAKE A FULL LINE OF LIMESTONE CRUSHERS AND GRINDERS. WRITE FOR BULLETIN No. 4

General Sales Dept., Old Colony Bldg., CHICAGO, ILL.
2705 N. Broadway, ST. LOUIS, MO.
268 Market St., SAN FRANCISCO, CAL.

The Williams Patent Crusher & Pulverizer Co.



The Machine that has POWER TO PRODUCE

and will pulverize limestone, sandstone, gravelstone, brick-bats, gypsum, phosphate rock, slag, glass cullet, manganese ore, coke, electro carbon, furnace linings, stove linings, quartz, etc.—and do the work with less speed, power and upkeep—built the strongest, best designed, best equipped.

Money Back

if machine fails to comply with our Specifications
Particulars and catalog for the asking

GEO. C. VIDETTO, Eastern Sales Manager
207 Fulton Bldg., Pittsburgh, Pa.

AMERICAN PULVERIZER COMPANY
EAST ST. LOUIS, ILLS.



Type "A-16" Loader loading 1 to 1½ cubic yards of Sand per minute. The Self-Propelling Device enables one man to operate the loader, feed it into the pile and move it about under its own power.

It Makes the Motor Truck Pay The Jeffrey Self-Propelling Loader

for handling Sand, Gravel, Crushed Stone, etc., will load a 5-Ton Truck in 4 to 6 minutes. The consequent reduction of idle time means increased efficiency for the motor truck, as it is enabled to make many more trips daily.

Users of Jeffrey Loaders are saving as high as \$11.55 per day, and loading and screening as much as a cubic yard of sand per minute.

Ask for Bulletin No. 177-35, our latest on Self-Propelling Wagon and Truck Loaders. It will point the way to loading Economy in your own plant.

THE JEFFREY MFG. COMPANY 935 NORTH FOURTH STREET Columbus, Ohio
New York Philadelphia Chicago St. Louis Milwaukee Boston Pittsburgh
Birmingham Dallas Denver Montreal Seattle



Sand Washers

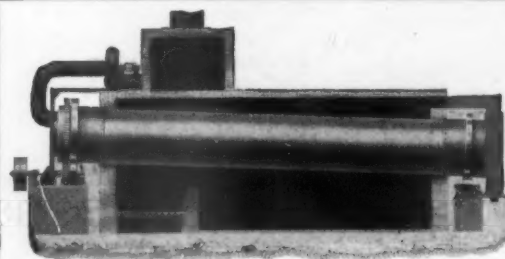


9-Foot Dry Pan

LEWISTOWN FOUNDRY & MACHINE CO.
LEWISTOWN, PA.

Builders of heavy duty crushers and glass sand machinery
Glass sand plants equipped complete

WRITE FOR PRICES AND CATALOG



We make the
largest variety
of
**MECHANICAL
DRYERS**

Write for
Catalog
No. 16

We are also Engineers and Manufacturers of
Car Hauls Feeders
Crushers and Pulverizers Mining Machinery
Drop Forged Chain Mixing Machinery
Elevators and Conveyors Sand Plants
Soft Mud Brick Machinery Screens

THE C. O. BARTLETT & SNOW CO., Cleveland, Ohio

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AUSTIN GYRATORY CRUSHERS

Made in Eight Sizes

50 to 5000 Tons Per Day

Plans and Specifications submitted and expert advice free on any problems involving rock-crushing or earth-handling.

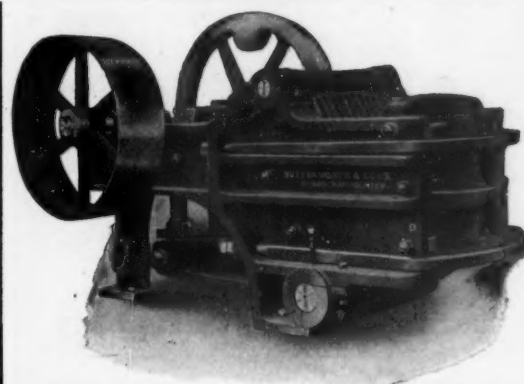
AUSTIN MANUFACTURING CO.

CHICAGO

New York Office: 50 CHURCH STREET

Canadian Agents: MUSSENS, Ltd., Montreal

We manufacture:—Road and Elevating Graders, Scarifiers, Road Rollers, Quarry Cars, Dump Wagons, Stone Spreaders, Street Cleaning Machinery.



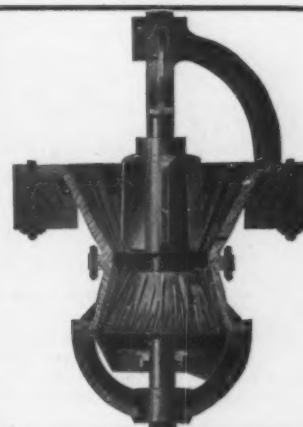
Jaw and Rotary CRUSHERS

For all Rocks and Ores Softer than Granite

GYPSUM MACHINERY—We design modern Plaster Mills and make all necessary Machinery, including Kettles, Nippers, Crackers, Buhrs, Screens, Elevators, Shafting, etc.

Special Crusher-Grinders for Lime

Butterworth & Lowe
17 Huron Street, Grand Rapids, Mich.



Nippers—17 x 10", 18 x 26", 20 x 30", 24 x 36" and 26 x 42"

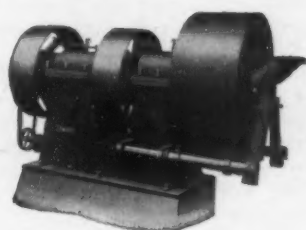
Crackers—6 sizes—many variations.

Record of 48-Inch Crusher for a Period of Approximately 11 Months—

	Per Ton Crushed
Operating labor.....	\$0.00214
Repair labor.....	.00205
Material for repairs.....	.00280
Power.....	.00899
Total.....	\$0.01598
Less extraordinary items.....	.00228
Cost under normal conditions.....	\$0.01370

No. 1 Crusher ran 4,392 hours and crushed 197,640 tons of ore. One pair of discs ran 3,453 hours, crushing 155,385 tons at cost of \$0.0014 per ton for discs.
No. 3 Crusher ran 4,462.5 hours, and crushed 200,812.5 tons ore. One pair discs ran 4,462.5 hours, crushing 200,812.5 tons at cost of \$0.00109 per ton for discs.
Crushers handled 45 tons per hour, crushing 8 in. to 1/2 in. and requiring 35 horsepower each.

Eventually Symons Discs



MANUFACTURED AND SOLD ONLY BY
CHALMERS & WILLIAMS
New York Office, Equitable Building
1450 Arnold Street, Chicago Heights, Illinois

The Same Work with Less Power

Cut down your running expenses by using less power. Power costs are high—each H.P. probably costs you between \$70 and \$90 a year. Therefore a pulverizer which gives you the same capacity as other crushers but uses from 5 to 10 horsepower less, saves between \$350 and \$900 a year for you in power costs alone.

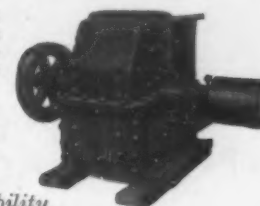
The All-Steel K-B Pulverizer

consumes only 10-15 H. P. to reduce 4-7 tons of stone or 8-13 tons of lime per hour from 3" to dust. The No. 2 K-B Pulverizer consumes only 20-25 H. P. to reduce 10-15 tons of stone or 20-25 tons of lime per hour. You can figure for yourself how much the K-B would save you in power costs.

Or better yet, write to us, sending us a small sample of your material, and we can tell you exactly how many tons of your material the K-B will crush per hour, and just how many H. P. will be required.

K-B PULVERIZER CO., Inc.
86 Worth Street New York City

Built for Service and Durability.



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Crushing Machinery Built to Meet All Demands

Large eccentric bearing. Spider arranged for removal of the concaves without dismantling the crusher.

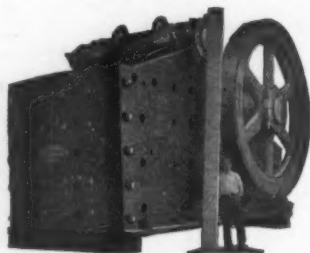


Shaft suspended at point of least motion.

Cast steel gear and pinion. Removable counter-shaft bearing.

Built in sizes from No. 2 up to No. 10.

Water-cooled pitman and pitman bearings. Removable bushings in pitman and pitman bearings.



Large openings allowing steam shovel operation.

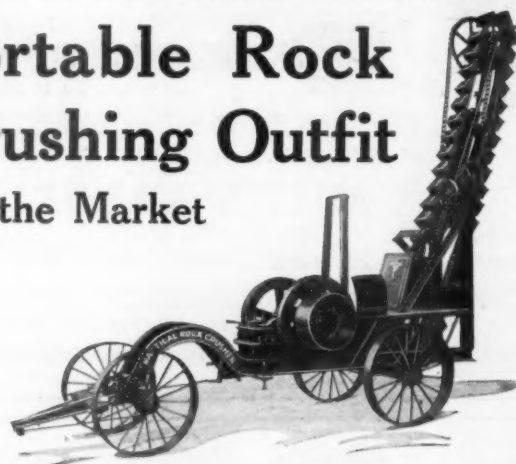
Built in sizes up to 66" x 86".

Traylor Engineering & Manufacturing Co.

Works: Allentown, Penna.

Eastern Office: 24 Church St., New York City; Western Office: Salt Lake City

This Is the Most Efficient Portable Rock Crushing Outfit On the Market

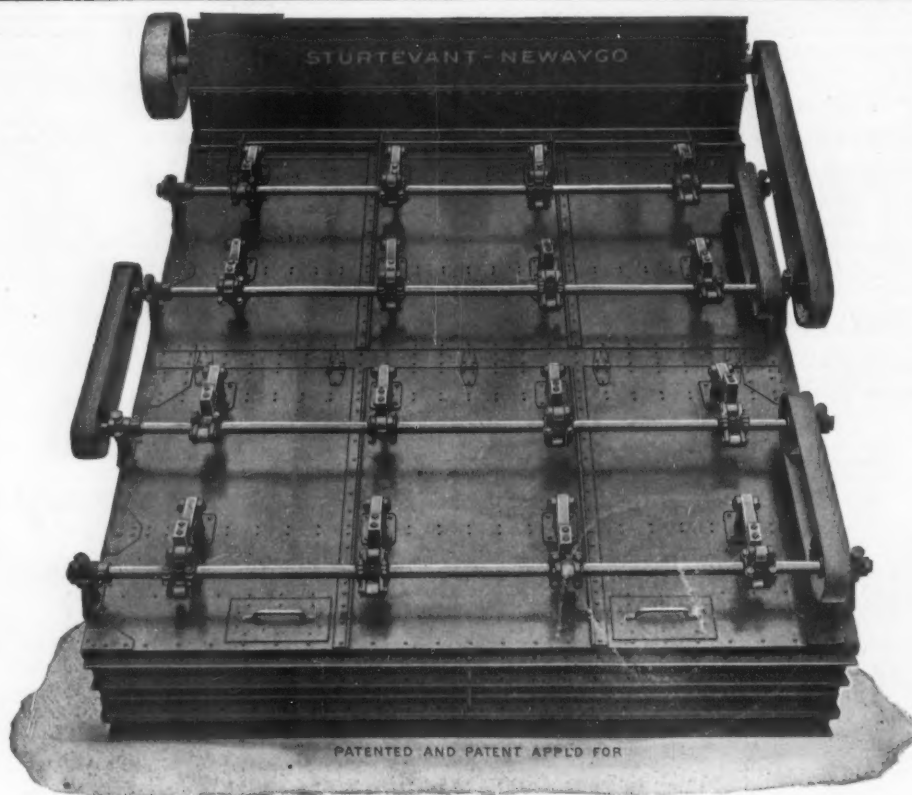


The old troublesome joints of the folding type have been eliminated, and the elevator is all in one section, always ready for use.

CONSTRUCTION—Made entirely of open hearth steel (except fly wheels and pulley). No wood construction. Crusher equipped with jaw plates and liners made of our well-known Hard Iron. Elevator is light but rigid, being constructed of structural iron shapes.

Write for further interesting facts on this outfit

Webb City & Carterville Foundry & Machine Works
Main Office, Webb City, Mo.



PATENTED AND PATENT APPLIED FOR

STURTEVANT

NEWAYGO GIANT SCREEN

144 SQ. FT. OF SCREEN AREA
LARGEST INCLINED VIBRATING
SCREEN, FOR BIG SCREENING UNITS

Screens Everything Screenable

FROM 1/4 INCH TO 100 MESH

Newaygo Screens are built in many styles and sizes to fit nearly all kinds of materials, conditions and capacities. There are thousands in use.

Newaygo Principle:—

Inclined screen surface—so that coarse mesh produces fine product—large openings do not clog—coarse wire is durable. Wire cloth stretched tight and held taut tapped by hundreds of little hammer blows upon its reinforced surface gives an unequalled vibration without destructive shocks. No eccentrics, no bumping mechanism. Less than 1 H. P. operates the largest. Large capacity; accurate output.

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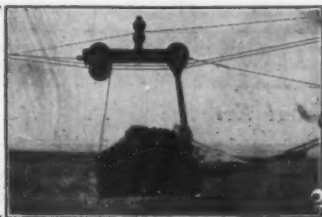
More in Use Than All Others Combined
STURTEVANT MILL CO., HARRISON SQUARE, BOSTON, MASS.

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This Is Our Type "F" Bucket

Write us your condition and requirements and we will advise you if our equipment is adapted to your work.

The Cable Excavator Co.
Commercial Trust Building,
PHILADELPHIA, PENNA.



The Brainard Pulverizer

Positively does not grind the material, works by impact only and will handle either wet or dry feed. All principal wearing parts are made of the best grade of manganese steel, and the casing is steel lined throughout.

A guaranteed Pulverizer, strong, durable and efficient. Made in four sizes.

WRITE FOR FURTHER INFORMATION

Midland Crusher-Pulverizer Company
Old Colony Building, Chicago

The Stedman Pulverizer

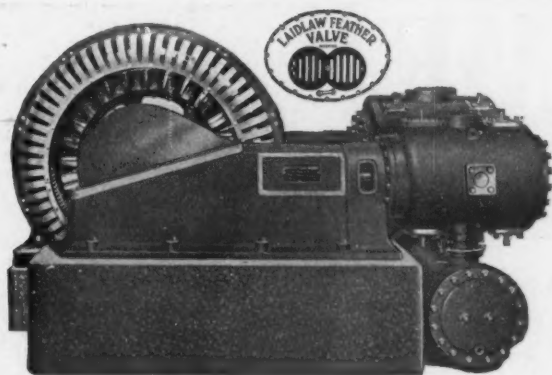
The simplest and most powerful pulverizer ever offered to the trade—for pulverizing limestone and other materials—

ESTABLISHED 1834

STEDMAN'S FOUNDRY & MACHINE WORKS

(Manufacturers of disintegrators, pulverizers, grinders, mixing machines of all kinds, dump cars, shaker and revolving screens, elevators, conveyors, pulleys and sprocket wheels. Designers of complete crushing, grinding, mixing and screening plants.)

AURORA, INDIANA, U. S. A.



LAIDLAW Feather Valve COMPRESSORS

include features which greatly increase the return heretofore possible for money invested. These machines have established notable records for low operating costs.

Described in detail in Bulletin L-530-58.

Write for acop.

WORTHINGTON PUMP AND MACHINERY CORPORATION

Successor to International Steam Pump Co.
115 Broadway, New York

Laidlaw-Dunn-Gordon Plant, Cincinnati, Ohio
Branch Offices in all Principal Cities

L281.2

Cut the Cost —of— Crushing Stone

—by—
Using a Modern Steel Crusher



The No. 20 (22" by 50") Champion Steel Rock Crusher (The Ton a Minute Machine)

Any crusher will crush stone—that's what it's built for. The machine that crushes stone economically is the one that puts money in the bank.

The best and easiest way to make money is to save it. The Champion Crusher saves money for its owner in these particulars. Notice them carefully.

1. It costs less to install because it is lighter in weight and more compactly built than other crushers.
2. The feeding mouth of the Champion is considerably lower than in other crushers of the same capacity. The disadvantage, to say nothing of the expense of raising stone to a great height must be apparent to any practical man.
3. It requires less power to operate the Champion than it does to drive other crushers of the same capacity.
4. The Champion takes larger pieces of stone than can be fed into gyratory machines of the same capacity. Hence a saving in preparing the stone for the crusher.
5. Parts are more accessible and therefore more easily taken out and replaced in the Champion than in other machines.
6. The upkeep is considerably less in the Champion. The parts are principally of steel which wear longer than cast parts. There are fewer bearings to wear out and cause trouble.

Our catalogue K A Y will give you some up-to-date and valuable information on the cost of operating different types of crushers. It is yours if you give us your name and address.

The Good Roads Machinery Co., Inc.
FORT WAYNE, INDIANA

Tell 'em you saw it in ROCK PRODUCTS AND BUILDING MATERIALS

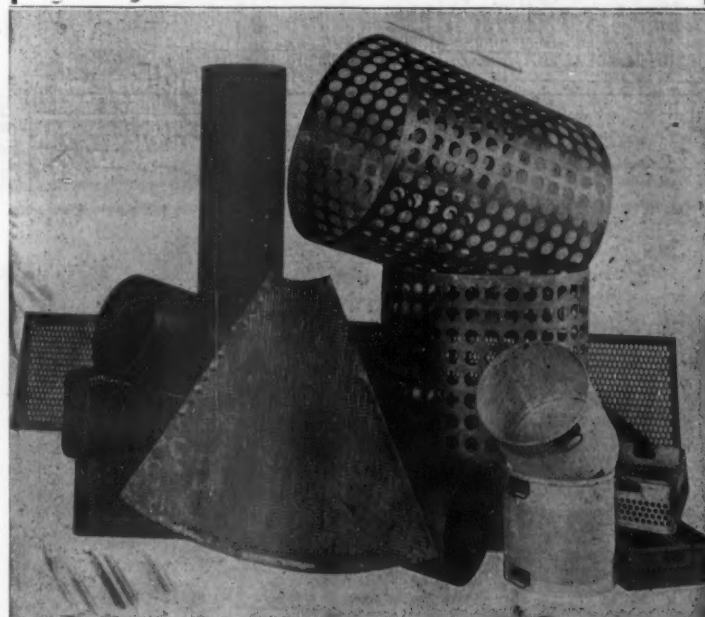
The Toepfer Hydrator

was two years in continuous use at one plant working ten hours daily before being put on the market. Another machine installed last season will pay for itself in one year at its present rate of saving over former methods. This machine was started by an inexperienced man and turned out a first class product from the very first day. THAT SHOWS THE SIMPLICITY OF THE TOEPFER HYDRATOR.

W. Toepfer & Sons Co.
MILWAUKEE

PERFORATED METAL

Steel Screens Iron and Steel Work



ELEVATOR BUCKETS, STEEL TANKS, ETC.
W. TOEPFER & SONS CO.
84 Menominee St. ESTABLISHED 1855 Milwaukee, Wis.

HYDRATED LIME

Its Marvelous Increase In Consumption

The Kritzer Service

Any lime can be successfully hydrated by our process; but whether your lime can be hydrated and successfully marketed is another question. We study your proposition and the possibilities of its commercial success, and advise you accordingly. Our ten years' experience in the business is a valuable assistance in this. Ours is not a mail order proposition. We investigate our customers' proposed plant thoroughly before we will enter into a contract with them. We turn down more prospects than we advise to go into the business. We can't afford to have any failures. Our customers' success is our success.

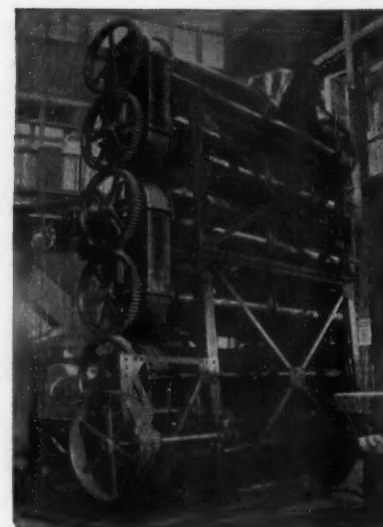
WRITE TO US

Are You Meeting the Increasing Demand for Hydrated Lime?

There is nothing forced or unnatural about the growing popularity of this product. It is a natural growth resulting from a widespread awakening to the advantages of Hydrated Lime for a variety of uses—as waterproofing for Concrete, in wall plaster, and in almost every case where lime is called for. In hydrated form it is weatherproof, more easily handled, and better adapted to modern methods, both of commerce and construction. A continued growth of the demand may therefore be expected.

The Kritzer Way

insures a product which will hold a continued place for itself on the market. We install plants complete, designed by our own expert engineers to meet your local conditions and turn out a uniform grade of Hydrated Lime of the highest standard, and with the greatest economy in cost of production. The Kritzer Continuous Hydrator, and the accessories installed with it, are the recognized standards in this line.



KRITZER CONTINUOUS
PROCESS

THE KRITZER COMPANY Chicago, Ill.

Tell 'em you saw it in ROCK PRODUCTS AND BUILDING MATERIALS



It IS Better

The Erie Revolving Shovel

In accessibility of all working parts, it is better.

In simplicity and ease of operation, it is better. Three levers and one foot brake give the operator complete automatic control.

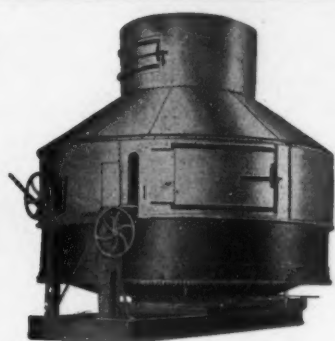
In speed of operation, as well as in its digging power and wide range of action, it is better.

In roominess of cab, in proper distribution of weight, in the way the weight is used to add to the machine's lifting power and especially in strength, sturdiness, general stand-up-to-it-ness, the ERIE Shovel is better.

In ability to handle more yardage—to make you more money on that work of yours—that's where it's best of all.

Get full particulars. Ask for Bulletin R-14

BALL ENGINE COMPANY, Erie, Pa.



Clyde Hydrator with Hood
"The common sense way"

SIMPLICITY IS THE KEYNOTE OF SUCCESS

IT does not take a "master mind" to install a CLYDE Hydrating plant, nor does it take a "high priced" engineer to run one. If **YOU**, Mr. Lime Manufacturer, realized how simple it is to obtain a PERFECT HYDRATE, with the CLYDE HYDRATOR you would place your order with us by FIRST MAIL. Write us today—NOW, and let us explain to you what CLYDE PROCESS hydrated lime is and how to obtain the best results, then

Use your own judgment—it's up to you

H. MISCAMPBELL, Duluth, Minn.

Patentee and Sole Manufacturer

Another Successful Limestone Operation!



The Hydrating Plant, Kiln Battery, and Stone Plant of Steacy and Wilton, Bittinger, Pa., illustrated above, are but another example of successful Steacy-Schmidt installations.

The engineering department of the Steacy-Schmidt Mfg. Co. is at the service of any firm interested in efficient methods for crusher plants, lime kilns and hydrating plants.

"Success Builders for the Limestone Industry"

STEACY-SCHMIDT MFG. CO.
YORK, PENNSYLVANIA

Manufacturers of the famous Keystone kilns—183 now in use.

Trap rock, sand, gravel, coal, coke, ashes, etc., can all be loaded into your trucks at the rate of

1 cubic yard per minute
with 2

HAISS WAGON LOADER

for a cost of less than one cent per cubic yard for electric or gasoline power

This loader is different from all other machines of this type—IT DIGS—the others only elevate the material. Write us for more information. Do so while you think of it.

Geo. Haiss Mfg. Co.
146th St. and Rider Ave.
NEW YORK CITY



In Successful Operation

The Negley Excavator



The dragline slack cableway excavator for all operations—discharges fast or slow as desired at the mast or anchor.

Economy in Operation and Maintenance

Indianapolis Cable Excavator Company 216-18 Mass. Ave.
Indianapolis, Ind.

Tell 'em you saw it in ROCK PRODUCTS AND BUILDING MATERIALS

Why Not Modernize Your Yard?

You may have the latest type of Crushers, Auto Trucks, etc., but if your equipment does not include a



McMYLER INTERSTATE CRANE

to handle materials, shift cars, place your screens, load trucks and a hundred other things you are losing a legitimate part of your profits. We will be glad to submit figures if you are interested in improving your yard conditions. Bulletin on request.

Address inquiries to the nearest office

The McMyler Interstate Co., Dept. P-5, Cleveland, Ohio

Chicago, New York
London

Gravel Washing Equipment

We are engineers and specialists in designing and equipping complete gravel washing plants. We have had fifteen years' experience in this class of work and during this time have perfected and patented numerous labor-saving, cost-cutting devices, and have gained the reputation of being the leaders in this particular field.



Complete Plant — Dull Designed and Dull Equipped

If you contemplate the installation of a plant, let us show you what we have done, and what we can do. Our engineering department is at your service.

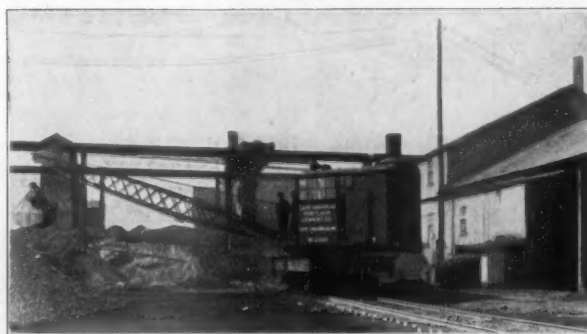
OUR CATALOG SENT ON REQUEST

The Raymond W. Dull Company

1914 Conway Building

Chicago, Illinois

A Comparison of Cranes



IN order to procure the very best crane on the market, the Cape Girardeau Portland Cement Co. sent an engineer to inspect and examine every make of Locomotive Crane they were considering—and we've painted their name on an "Ohio" Crane.

They have very severe service and they needed the best. Ask them if they got it.

90% of the "castings" are basic open hearth steel

Write for Catalogue No. 11

Ohio Locomotive Crane Co., Poplar St., Bucyrus, O.

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YOU WILL DO BETTER With an **OSGOOD**

Osgood "18" $\frac{3}{4}$ yd. Traction revolving steam shovel is the practical shovel for the lighter class contracting, such as road building, cellar excavating, sewer trenching, stripping, gravel pits, etc.

Osgood "43" $1\frac{1}{2}$ yd. Traction Steam Shovel with spur gear drive, for quarry and heavy contract work.

Write us your requirements

THE OSGOOD CO., Marion, O.



DID YOU EVER FEEL THE NEED OF A LIGHTER, CHEAPER, SIMPLER LOCOMOTIVE CRANE?

mounted on road wheels to run anywhere?

BYERS

AUTO-CRANE

Fills that need. We will tell you all about it.

Chicago Office: 1440 Monadnock Bldg.
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The John F. Byers Machine Co.

310 Sycamore St., Ravenna, O.
(HOISTING ENGINES AND DERRICKS)

YOUR PAN NEEDS

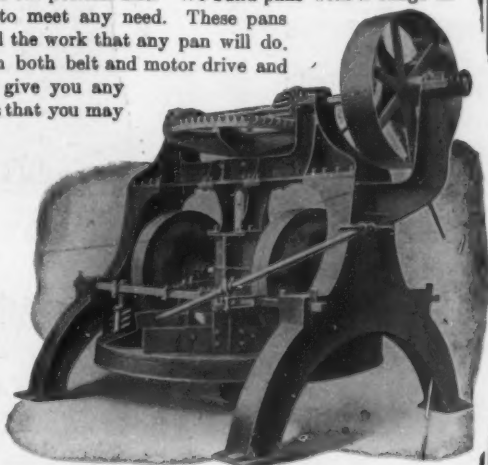
THIS pan is the identical pan required for your plant and it should speak to you convincingly of our pan quality. It has put many Sand-Lime Brick Plants on a paying basis and will make money for you. There is no line of pans made which will compare with the "Built Right, Run Right" line and your needs can be fully taken care of from our peerless line. We build pans with a range in size and capacity to meet any need. These pans are adapted for all the work that any pan will do. We have them in both belt and motor drive and will be pleased to give you any points on our pans that you may inquire about.

A poor pan is an expensive proposition. Its inefficiency shows in the quality of your product and the size of your repair bills. It also limits your capacity by handicapping the rest of the equipment. Real economy would suggest that your pans be the best possible. We will be pleased to talk pans or any other equipment with you.

*We Build Complete Equipments for
Sand-Lime and Clay Brick Plants*

The American Clay Machinery Co.

Willoughby, Ohio, U. S. A.



The Day of Mixers Is Here

Concrete—Mortar—Plaster

A Mix a Minute

The Jaeger Machine Company

219 W. Rich Street

COLUMBUS, OHIO



HOISTING rope of every description for elevators, mines, coal hoists, ore hoists, conveyors, derricks and cranes, stump pullers, steam shovels, dredges, skidder rope for logging, ballast, unloading. Towing hawsers, mooring lines, tiller rope, and ship's rigging. Power transmission. Suspension bridge cables. Rope for all haulage purposes. Flattened strand rope. Non-spinning rope. Steel clad Flattened strand rope. Non-spinning rope. Steel clad rope. Locked coil track cable for aerial tramways. Flat rope.

Special rope made to order to suit any purpose

American Steel & Wire Company

Chicago New York Cleveland Pittsburgh Worcester Denver

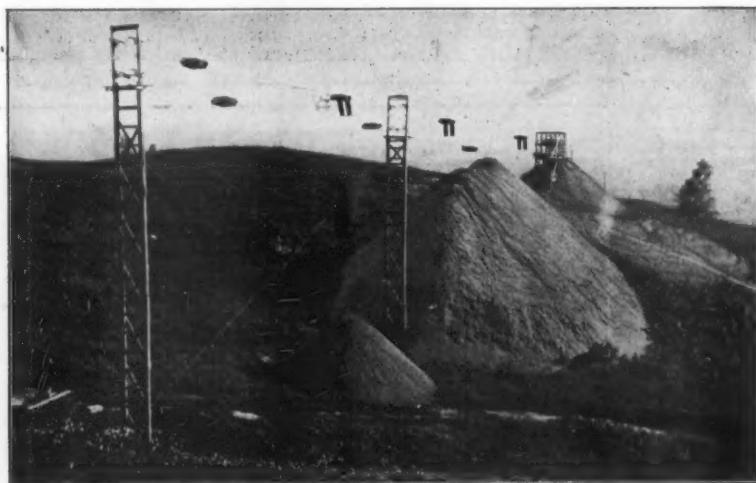
Export Representative: U. S. Steel Products Co., New York

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Distributing Material to Storage Pile or Spoil Bank THE LOOP LINE TRAMWAY

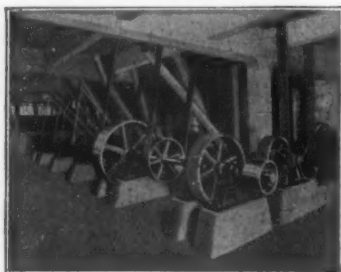
with its continuous procession of barrows may be readily adapted to the distribution of material anywhere along the line by the simple expedient of equipping the barrows with



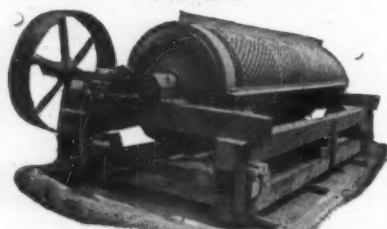
drop bottoms and the track with a movable tripping device which automatically unlatches the bottoms at any desired point. This is but one of many services to which Loop Line Tramways are adapted.

*Let Us Help You with
Your Problem!*

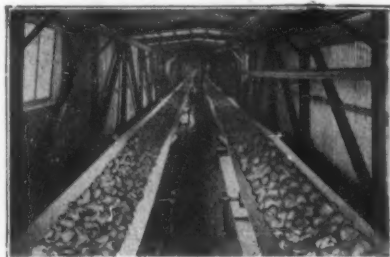
Ambursen Company
61 Broadway New York City



Complete power transmission equipments
of all kinds



Revolving screens of every type
for every purpose



Belt conveyors for any material.
10 to 60 inches wide.

WELLER-MADE EQUIPMENT

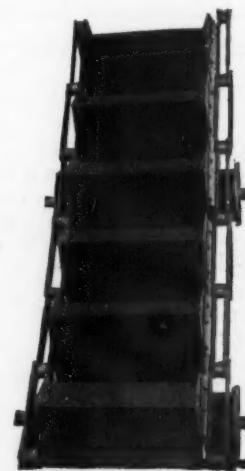
For Stone and Gravel Plants

MEANS economy in operation and 100% capacity in production—Screens of all types, bucket elevators, power transmission and conveying equipment, etc., are designed for the most efficient methods of handling your material.

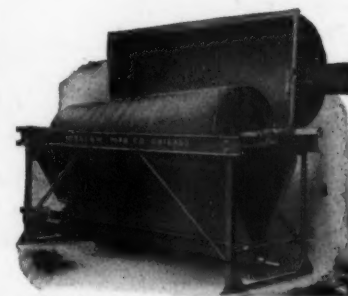
IT'S WORTH EVERY CENT WE ASK FOR IT.

Write for general
catalog P-20

WELLER MFG. COMPANY
CHICAGO



Heavy bucket elevators up
to 84" wide and 36" pitch



Special enclosed screens for dusty or
fine materials

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Ehram, J. B., & Sons Mfg. Co.
Miscampbell, H.
Williams Pat. Crusher & Pulverizer Co.

POWDER.

Du Pont de Nemours Co., E. I.

PREPARED ROOFING—SHINGLES.

Carolina Portland Cement Co.
Reynolds Asphalt Shingle Co.

PUMPS.

Allis-Chalmers Mfg. Co.
International Steam Pump Co.

QUARRY CARS.

See Cars.

ROAD BUILDING PREPARATION.

Glutrin Paving Co.

ROAD MACHINERY.

Austin Mfg. Co.
Osgood Co., The.

ROOFING-METAL.

Sykes Metal Lath & Roofing Co.

SAND AND GRAVEL WASHING PLANTS.

Dull & Co., Raymond W.
Good Roads Machy. Co.
Link Belt Co.
Stephens-Adams Mfg. Co.
Webster Mfg. Co.
Weller Mfg. Co.

SAND LIME BRICK MACHINERY.

Amer. Clay Machy. Co.

SCALE CARS.

Atlas Car & Mfg. Co.

SCREENS.

Allis-Chalmers Mfg. Co.
American Pulverizer Co.
Butterworth & Lowe.
Dull & Co., Raymond W.
Ehram, J. B., & Sons Mfg. Co.
Good Roads Machy. Co.
Halse Mfg. Co., Inc., Geo.
Hendricks Mfg. Co.
Jeffrey Mfg. Co.
Johnston & Chapman Co.
Link Belt Co.
McLanahan Stone Machine Co.
Power & Mining Mach. Co.
Stephens-Adams Mfg. Co.
Sturtevant Mill Co.
Toepfer, W., & Sons Co.
Webster Mfg. Company.
Weller Mfg. Co.

SECOND-HAND MACHINERY.

Bourse.

SEWER PIPE.

Plymouth Clay Products Co.

SHEAVES, BLOCKS AND VALVES.

Halse Mfg. Co., Inc., Geo.

SINK AND FLOAT TESTERS.

Pennsylvania Crusher Co.

STEAM SHOVELS.

Ball Engine Co.
Osgood Co., The.

STUCCO RETARDER.

National Retarder Co.

TIRES—RUBBER.

Goodrich, B. F., Co.

TRAMWAYS.

Ambursen Company.
American Steel & Wire Co.
Link Belt Co.

TUBE MILLS.

Allis-Chalmers Manufacturing Co.
Power & Mining Mach. Co.
Smith & Co., F. L.

WALL PLUGS AND TIES.

Canton Metal Ceiling Co.
Sykes Metal Lath & Roofing Co.

WATERPROOFING.

Cabot, Samuel, Inc.
Carolina Portland Cement Co.
Ceresit Waterproofing Co.
General Fireproofing Co., The.
Sandusky Cement Co.
Toch Brothers.
Trus-Con Laboratories.

WEIGHING MACHINES.

Sturtevant Mill Co.

WIRE AND WIRE FENCING.

American Steel & Wire Co.

WIRE ROPE.

American Steel & Wire Co.
Leschen, A., & Sons Co.

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JUN 28 1916

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INCORPORATING DEALERS BUILDING MATERIAL RECORD

Volume XVIII.

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Copyright, 1916, by E. H. Defebkaugh.

All of our reports indicate very active building markets in all parts of the country.

The typical builders' supply dealer of the very near future will be somewhere near the brightest merchant in each community. It has taken some time for the individuals to find themselves amidst the new incidentals of an entirely new horizon of business activity.

Eighty per cent of the dealers in builders' supplies have never found the profit advantages of handling metal lath and kindred specialties. All such can well afford to do a little investigating right now. You are not too busy to make more money out of your business.

More than half of the classy literature designed to extend the sale and use of all the staple building materials fails because it is too technical, too complex, and too high flown. We have all got to get down to the level of the audience, like only the playwrights have learned how to do.

Reinforced concrete is the logical material for factory construction where fire protection is worth considering at all times. Right now when structural steel is soaring 200 per cent above normal in price it is the only possible economical way to build. Concrete has not advanced noticeably in cost.

Transportation of the materials of construction has always been the limiting factor in the problem of greater expansion of building and permanent improvements of every kind. The cost of delivery often amounts to more than the price of the material itself. Economies in this item are of the first importance, hence the pressure for minimum railroad rates, the need of development and freedom from molestation of the waterways, and last but not least the intelligent application of the motor truck for the final delivery service.

The cost of transportation fully considered is the largest tax upon the individual. It absorbs nearly one-fourth of the earning capacity of the average citizen. Improved roads alone reduces this huge burden. Let us have as quickly as possible roads to secure the minimum cost of transportation, that great stumbling block of all the ages.

Almost double wetness seems to have found expression in the amount of agricultural lime being used by the farmers. At any rate, the volume is very gratifying and seems to be growing apace. Those who complain of too much rain could better afford to raise an umbrella over their quarries and keep right on going.

Road improvements now undertaken and to be extended this summer exceed all previous records. This not only applies to the great trunk roads that span the continent, but also includes a very largely increased mileage in the network of roads of purely local importance. By the use of modern equipment, particularly that directed to the transportation feature, the whole process of road building is simplified and cheapened. We therefore have a right to expect an ever increasing mileage as the labor saving machines become better known, and more numerously employed.

Rumors of war and the rapid mobilization of troops seem to indicate that force at last must be used to settle unbearable conditions in Mexico. Too bad that this was not done more than three years ago when American troops held Vera Cruz, and the whole operation was so much simpler than it is now. It is disgrace and shame upon this republic now to be compelled to sacrifice the lives of unprepared thousands of brave, young patriots upon the altar of polluted politics in the visible government and rotten graft in the invisible forces that control the big political game. Their blood be upon the heads of the guilty.

Local politics in the road game is the worst feature of the whole problem. An enormous percentage of the tax dollars provided by law for road construction and road maintenance goes for the support of worse than useless officials. These in turn play favoritism with the individual voters who support them at the polls, by paying the highest rates for second-rate inefficient teams, and big wages for a very poor grade of labor. It is worked purely upon the graft basis, without any regard to the road results at all. There would be a very great difference in the amount of road material used if a way could be found to hold petty road officials responsible for results in some measure for the public moneys they are supposed to administer with caution.

Advance labor cost is felt in every quarry operation with increasing effect. In many places quarry labor is double the price it was one year ago. Only those operators who were wise enough to put in mechanical tools to displace labor can now operate profitably upon a large scale. High labor costs have automatically advanced the selling price of every commodity dependent upon quarry operations for the supply of raw materials. This is inevitable, and the mill prices of all the staple building materials have been affected to that extent, plus another heavy increased item due to excessive advances in all kinds of mill supplies and repair parts for machinery. Building materials is the only line in which the advances in prices have all been warranted and logical with the actual cost basis of production. Further advances are imminent.

WITH YOU and ME

American Concrete Products Co., Chicago, Ill.; capital, \$25,000; to manufacture concrete products and do construction work.

Pulaski Stone & Construction Co., Little Rock, Ark., capital \$10,000; incorporators, E. N. Wiegel, J. H. Parkin, M. V. Parkin and W. B. Wiegel.

The picnic of the Pittsburgh Builders' Exchange will be held on June 29; a good entertainment is planned and a fine time anticipated by everyone.

The entire quarry plant and equipment of the John T. Dyer Co., at Howellville, Pa., was purchased recently by the E. J. Lovina Co., of Philadelphia, for \$75,000.

The Hummel Glass Sand & Limestone Co., Pittsburgh, Pa., capital \$25,000; directors, O. J. Vilsack, L. R. Ramsey, H. B. McClure, Mrs. F. W. Ramsey, Entriken, Pa., and C. C. Hartman, Derry, Pa.

Standard Rock Products Co., Los Angeles, Cal., capital \$25,000; incorporators, W. A. Boland, Grass Lake, Mich.; E. J. Longyear, Minneapolis, Minn.; C. M. Jay, Wm. B. Howell and J. V. Andrew, Los Angeles.

The K-B Pulverizer Co., Inc., with main offices at 86 Worth street, New York City, has established a branch office at 704 Bulletin building, Philadelphia, Pa. This office is in charge of Charles M. Connor, who is well known among the machinery trade in this district.

William S. Speed, of the J. B. Speed Co., Louisville, Ky., was a captain in an interesting "tug-o-war" which took place at the outing of the Engineers and Architects' Club, at West Point, Ky., where they viewed the big government work being done on Dam 48.

Leo M. Parsons, of the Tyler Building Supply Co., Louisville, Ky., recently landed a dandy contract on white enamel Hytex brick to be used in facing the bakery, laundry, kitchen, etc., at the Central Kentucky hospital. The contract calls for several cars of this fine facing material.

H. J. Ouellette, who was in charge of the Detroit office of the General Roofing Co., has been made Southern manager of the company, with headquarters at Atlanta, Ga. Mr. Ouellette, on assuming his new position, made a tour of his territory, becoming acquainted with the dealers handling Certain-feed goods.

Fred L. Dickey, general manager of the Walter S. Dickey Clay Manufacturing Co., was recently elected second vice president of the Kansas City Commercial Club. George H. Tefft, secretary of the company, is now serving as member of the hospital and health board. Mr. Walter S. Dickey is a candidate for the republican nomination as senator.

The Klaberry Corporation has been organized by F. H. Klabfleisch, R. S. Perry and Paul W. Webster, with offices in the Metropolis Building, 31 Union Square, West, New York, to conduct a chemical engineering business. They are collecting catalogs of such apparatus as work in this line may develop, such as pulverizing machinery, crushing, elevating,

conveying and measuring devices. They expect to do chemical research work, and will handle the construction of manufacturing plants and apparatus appertaining to the same.

E. M. Tate, secretary and treasurer of the Pittsburgh Builders' Exchange, has been appointed commissioner for the state of Pennsylvania, representing the National Association of Builders' Exchanges. The local exchange will hold its annual picnic at the "Pines" at Perryville road, June 29, and all kinds of athletic sports will be put on.

The name of Schaeffer-Gengnagel & Co. was omitted from the list of retailers who were reported in the June 7 issue of ROCK PRODUCTS AND BUILDING MATERIALS to have organized the Building Material Dealers' Club of Dayton, Ohio. This firm is one of the seven charter members of the organization which has been formed for the purpose of interchanging ideas on the handling and selling of building materials and credit.

Homer Morrison, who represents the General Fireproofing Co., in its waterproofing lines, was a recent visitor in Nashville and was brought to one of the weekly luncheons of the Nashville section of the Engineering Association of the South by John Wilson, the local representative of this company. Mr. Morrison was called on for a talk on the subject of integral waterproofings and before he had finished with the subject it had become the entire order of business.

Henry S. Gray, secretary-treasurer of the J. B. Speed Co., Louisville, was one of fourteen delegates from the Louisville Credit Men's Association to attend the meeting of the National Association of Credit Men, held at Pittsburgh, Pa., June 13 to 16. The Louisville organization has done a great deal of excellent work during the past year, principal of which was the raising of a large fund with which to push prosecutions against concerns or individuals guilty of fraudulent failures.

At the meeting of the stockholders of the Burlington Brick & Tile Co., at Burlington, Wis., the resignation of William Meadows as secretary, treasurer and general manager was not accepted. Mr. Meadows was granted a leave of absence for as long a period as he wished. During his absence, Henry Storey will be acting general manager of the plant and J. J. Marquis will be business manager.

The Miller Sales Co., formerly located at Anderson, Ind., have removed their offices to the Hume-Mansur building at Indianapolis. This concern has been interested in the introduction of Roemac road surfacing which is used in connection with pulverized limestone. They report contracts for seven miles of improved highways in Indiana using their surfacing material, two of these extending from Clayton to Belleville in Hendricks county, three miles in Greencastle, Putnam county, a mile in Rushville, Ind., and two miles in Anderson, Ind.

The Jeffrey Manufacturing Co., of Columbus, Ohio, announces the reopening of its northwestern branch office at Seattle, Wash., and the appointment of Percy E. Wright, consulting mechanical engineer, as district manager for Oregon, Washing-

ton, Alaska, British Columbia and Alberta. Mr. Wright, who has been in the northwest since 1910, and whose connection with this company dates back to 1902, has had a wide and varied experience and training in the handling of the Jeffrey line in the engineering, construction and sales departments, which will enable him to be of great assistance to customers in solving their elevating, conveying and transmission problems.

Stephen J. Hayde, for many years a contractor in Kansas City, former member of the board of public works, who last fall bought an interest in the Flanagan-Zeller Brick Co., is managing the property. It is now turning out 35,000 pressed brick a day—and all of it is sold in the city. In fact, three months' output is sold ahead. The company is delivering on one order 1,250,000 to the six-story warehouse of the Duff & Repp Furniture Co., being erected by the Ettwein Building & Construction Co.

An interesting event during the recent trip of the Nashville, Tenn., Boosters' Club, through Alabama and Mississippi, was the stop at Rockwood, Ala., where the boosters visited the quarry of the Foster & Creighton Co., which has its general offices at Nashville. The party was met by R. T. Creighton, president of the company, who is a member of the Nashville Park Board and otherwise prominent in public affairs, Capt. Creighton showed them all the operations of the big plant, showing how rock is quarried both for cut-stone and for rip-rap and crushing purposes.

BUSINESS MEN FOR PREPAREDNESS.

Washington, D. C., June 3.—Business men want preparedness. They have voted for it in a referendum of the Chamber of Commerce of the United States. A majority of 120 to 1 was recorded. Those who have a definite stake in the country and must bear a large share of the burden of paying the bill for national defense have come out squarely for a comprehensive scheme involving the entire military, industrial and financial resources of the nation.

There has been propaganda of all kinds for preparedness and non-preparedness, including straw votes, newspaper campaigns, and the circulation of pamphlets and statistics. This, however, is thought to be the most thorough and complete effort yet made to ascertain country-wide sentiment on a question so prominently before the people and Congress.

According to the vote cast, it is now said to be known exactly where the business men of the country stand on the general question of preparedness and also what their views are for an adequate army, a largely increased navy, a thorough-going industrial preparedness, and the basis on which all these features must rest—universal military training.

Chicagoans showed their belief in preparedness when, on Saturday, June 3, they formed a parade the equal of which, numerically, has never been known in civilian circles. Over 130,000 persons were in line and all branches of industry were represented. B. F. Affleck, president of the Universal Portland Cement Co., was marshal of the building material division.

THE VALUE OF MILITARY TRAINING.

Henry C. Emery, former chairman United States Tariff Board, in the Nation's Business says:

Political economists in the past and a very large class of business men have opposed military preparedness on the grounds of economic cost. The most obvious objection has been the actual money cost on the part of the Government, involving taxation of the people. It is true that wastefulness in military appropriations has given good ground for protest on the part of the opponents of military establishments. If, however, the military establishment makes for greater industrial efficiency the money cost is an investment of capital, not destruction of wealth.

The main argument, however, against the maintenance of a military establishment from the economic point of view, has been the great loss of labor power which is involved in the maintenance of hundreds of thousands of men under arms. To the old-fashioned economist this argument seems conclusive. Even admitting the necessity of an army for national defense, it was none the less supposed to involve a terrible cost in the way of labor power which might otherwise be utilized in the production of wealth.

It is a false assumption, however, to suppose that all the labor power of a country is normally utilized to its full capacity. The quantity of labor available for industry or used in industry is a very elastic quantity. It has been shown in various wars that despite the enlistment of a tenth of the total population, industry is somehow maintained on a level with its output preceding the war. This is due first to the reserve labor, not normally called upon, and second, to war's making use of those who had not found work in time of peace. It is certainly not true without qualification that every soldier, if not in the army, would be engaged in productive industry.

Any argument as to labor losses may be met by a consideration of the educational effects of military training. The attitude of thoughtful men has changed on this point in recent years. It seems to be agreed that the compulsory military service in Germany has worked very largely in the direction of a compulsory education increasing the efficiency of the population for industrial purposes. Young men are taken at a critical age, taught habits of order, cleanliness, discipline and promptness, knowledge of sanitation and many arts of production; and are instructed as well in many purely educational lines. They are largely restrained from the excesses to which youth is prone, and are turned back into industry with vigorous bodies, the ability to learn, and the capacity to endure sustained effort in the normal activities of life.

Turning to this country, and without raising the question of the possible political, moral or social arguments for or against a compulsory military system, what would be the economic effects if provision were made for general voluntary service and a large portion of the young men of the country should volunteer? Let us remember also the fact that the great mass of our population do not carry their education beyond the common schools.

Would a period of six months or even a year mean a serious sacrifice on the part of such volunteers, either for themselves or their families, and the equal sacrifice of an efficient labor supply on the part of the industrial organization? Young men at the age at which such service would be undertaken have not married and assumed family responsibilities. Many of them are simply on the industrial waiting list, not yet skilled or experienced in any particular line of production, frequently waiting for some opportunity to turn up, or moving aimlessly and restlessly from one occupation to another, trying to discover where they best fit into the established business order. Would not a vigorous military training merely take up the slack of idleness which is frequently to be found preceding a young

man's entry into the serious walks of life? Every American knows the young man of a certain type who, freed from the restrictions of boyhood and not yet aroused to the responsibilities of manhood, is employing a period of temporary independence in an idleness which is offensive to all but himself. There is a "hoodlum" period with many a youth before he realizes the necessity of making himself economically independent and respectable. Would not a majority of these youths be benefited and better equipped for the assumption of industrial activities if, during this period, they had learned the lessons which come from military service? An absence of orderliness and discipline is commonly recognized as the chief lack in the training of American youth, and is characteristic of the poor as well as the rich. Is not the discipline and training of military service the quickest and most effective method of overcoming this evil?

It has been recently said:

"Spoiled by misguided parents, undisciplined by impotent school teachers; our tendency is to grow up into self-willed men and self-indulgent women. Man-handled by poverty or molleheaded by wealth, the tendency is everywhere the same; intolerance of authority, contempt for obedience, aversion to laws, indifference to rules, and worship of self."

We need the discipline of military training. But let no one fear that such discipline would change our civilian character or militarize us. Those who fear that we may fall back into "militarism" by merely training ourselves in military discipline have a strange lack of faith in our loyalty to personal liberty and equal rights and individual freedom. But their fears are not justified. On this steep road which has led from Runymede through Gettysburg, we have climbed too high to fall through any mere system of training, either for war or for peace.

UNBURNABLE CITIES.

There is one fact pervading half the dispatches from the western war zone of Europe which Americans would do well to take to heart—the fact that neither bombardments nor direct incendiarism has been able to start such conflagrations as those which have devastated so many cities and towns in America. The European cities and villages, especially in what may be called the Napoleonic area, simply won't burn. When the Germans wished to destroy a Belgian town, they had to set fire to each separate house. The woodwork in that house, the floors and staircases, would be consumed, but the brick and plaster walls and tile or slate roofs kept the fire from passing on. In France it was the same. Rheims has been under fire six months and nothing more than local blazes have started in all that time. Try to imagine an American city subjected to such a trial.

MINNEAPOLIS CALLS COMMERCE DIRECTORS.

Prominent business men from all sections of the country will assemble in Minneapolis on June 22 to attend a meeting of the board of directors of the Chamber of Commerce of the United States. The annual meetings of the National Chamber are held in Washington where its headquarters are located, but occasionally meetings of the board are held in other cities. The invitation to hold the early summer meeting in the Northwest was extended by the Civic and Commerce Association of Minneapolis.

Aside from the business sessions on Thursday, the 22nd, there will be a luncheon by the Civic and Commerce Association, and dinner at the Minneapolis Club with a group of prominent business men of the city. On Friday there will be a luncheon given by the St. Paul Association of Commerce, an automobile ride about Minneapolis, and finally a dinner with invited guests at the Lafayette Club, Lake Minnetonka. R. Goodwyn Rhett, of Charleston, S. C., president of the National Chamber, will preside at the meeting of the Board of Directors.

NEW YORK SAND MEN BUSY.

The demand for sand and gravel in the Metropolitan district was never better than at the present time.

The increase in requirements has been reported as being above normal for this time of the year, partly because of the heavy engineering works now in progress in Manhattan. Sand is steady at the new levels recently reported. Gravel is stiff, even at the new quotations, especially for the three-quarter-inch size.

Building—	May 16.	June 13.
Cow Bay, screened, per cubic yard.....	\$0.40@....	\$0.40@0.50
Molding, N. Y. base—		
Jersey, molding, f. o. b. cars or boat, N. Y.....	.90@....	.90@1.25
Fine Albany, 00 0.....	1.00@1.25	1.00@1.30
Albany, 1, 2 and 3.....	.60@1.00	.65@1.05
North River, 1 to 4.....	.75@1.50	.75@1.40
Lumberton, Phila., Trenton and eastern Penn.....	.65@....	.60@.80
Core sand, Rockaway Beach—		
Dredged.....	.65@1.00	.65@1.00
Coarse.....	1.00@1.25	1.00@....
Fire sand—		
Net, f. o. b. car, per ton.....	.65@1.00	.65@.90
Gross, f. o. b. boat, per ton.....	1.10@....	1.10@1.25

PITTSBURGH SAND MEN BUSY.

Pittsburgh, Pa., June 19.—Sand men are getting their full share of business nowadays, although in some places it is not very brisk, especially where the concerns depend largely on the building trade. Corporation orders are helping out some of the sand companies greatly this summer, and their boats and barges are having all they can do to make these deliveries on time. Business in carload lots is reported very good in most cases.

The Rodgers Sand Co. will soon have in place one of the finest steel floats anywhere in the country, and the only one in this district. It will be placed at the foot of Fifth street and will have two immense scales on it so that several teams can load and weigh out at the same time.

IMPROVEMENTS IN BOTH OXFORD PITS.

Both of the sand and gravel pits at Oxford, Mich., have put in improvements to sustain the supply which principally goes into the city of Detroit. The United Supply Co.'s pit has been equipped with a new ninety-foot derrick and the Detroit Oxford Co. has installed a new washing outfit sixty feet high. Both of these plants are running to full capacity and their only trouble seems to be a shortage of cars.

The Rich Gravel and Excavating Co., Knights-town, Ind.; capital, \$1,500; will operate sand and gravel pits; directors, George Watts, John C. Marks and Clarence W. Rich.

The Myers Gravel & Sand Co., Anderson, Ind.; to operate a sand and gravel pit; directors, Joseph P., Frank and Linfield Myers.

Superior Sand & Gravel Co., Logansport, Ind.; capital, \$100,000; to operate sand and gravel pits; directors, John H. and Harry P. Barnhart and Michael W. Murphy.

The Kinzel-Thompson Sand & Gravel Co., of Knoxville, Tenn.; capital, \$30,000; incorporators, M. E. Thompson, William Kinzel, Frank Adney and Hugh Millin.

Thomas McFadden, of New Philadelphia, Ohio, has bought the plant of the Ohio & Pennsylvania Sand & Gravel Co. It is located near New Philadelphia.

The Warren-Silica Sand Co.'s plant at Torpedo, Pa., was sold last week at sheriff's sale for about \$20,000. The buyer was William Lousterer, of Jamestown, Pa.

The RETAILER

How Do You Handle Your Competitor?

Is a question that might be asked in vain from almost any building material dealer in the country. The usual answer is, "I have nothing to do with my competitor and naturally I have given no study to the question of handling him. It is up to him to handle himself."

In this reply, whether mental or oral, building material dealers of the country fool themselves. It is your business how your competitor conducts his business and should deserve a good deal of study on your part. Did you ever stop to realize what effect your competitor's methods of arriving at a price for which he sells his commodity effects your price? Isn't it a known fact that if a competitor delivers a barrel of cement for \$1.45 that you have got to do the same thing? Likewise, if a ton of lime is sold for nine dollars, how much more than nine dollars do you suppose you can get for a ton?

The usual attitude of a dealer toward a competitor who is cutting prices below what he knows the goods can be sold for at a profit is to let the competitor continue in such tactics until he has run himself into bankruptcy. This system of eliminating competitors might be successful if it were not for the fact that every time a man goes out of business there are at least six others who think very seriously of getting into business for the purpose of selling the trade which was formerly handled by the bankrupt concern. So, this process of elimination will have to be continued throughout a lifetime, during all of which the legitimate dealer, who is trying to sell on a fair margin of profit, will be compelled to meet this ruinous competition and as a result suffer, and possibly himself face the bankruptcy court.

Isn't it a better policy to permit this ruinous competition for a short period of time for the purpose of educating your fellow dealer on the folly of following such a plan, and, by the time the lesson has been taught, invite him to your office and show him, by your systematic method of keeping books, figuring overhead expenses and other incidentals important to your business; that his method is ruinous and that for the welfare of his own business, as well as yours, he must likewise learn how to figure every item of cost that enters into his business and add thereto a reasonable margin of profit.

Wherever progressive dealers have attempted this plan of educating competitors it has worked out successfully. Costs of doing business, overhead charges and similar expenses are practically the same in any given community, and when figured uniformly by competitors results in stapleizing the market and making prices about uniform.

There is no necessity of agreeing on any given price at which to sell the various products, as this system, if rigidly adhered to, is bound to have that effect and no laws will be broken while the building material dealers of such community will all profit.

BRICK STYLES CHANGE FREQUENTLY.

One of the perplexing problems of the building material dealer is to meet the demand for the various styles of face brick. It has often been said that the styles and colors of building brick change in any given market as often as does the styles of a woman's clothing.

The reason for these changes is easily discernible and can be attributed to aggressiveness on the part of architects, contractors, brick dealers or brick manufacturers. In cities where retailers have made a specialty of boosting a particular style of brick, evidences of their work are to be seen in buildings throughout the town. Because of this fact, every wide awake building material dealer should carefully study the various styles of brick offered by the manufacturer and place such brick in stock as he has absolute confidence in and for which he believes he can create a demand. When such selection is made a systematic campaign of educating the public through the newspapers and by other means should be adopted. The results will speak for themselves.

A MADE-TO-ORDER DEALER.

Under this title the Michigan Portland Cement Co., Chelsea, Mich., is distributing a small folder, containing in verse a plea for cement salesmen and for coöperation with the mill in the distribution of cement, the handling of sacks and the boosting of concrete. The poetry, which is credited to B. B. Turn Bull, is as follows:

Impressions gained in selling cement,
Are offered now for your comment.
The idea, perhaps, may not be new,
But (trust) it will be of interest to you.
Remember the salesman who works for a salary,
Would much prefer a seat in the gallery,
Than on a bench outside your door,
Wondering if you'll think him a bore.
Don't keep him waiting there too long,
Let him enter and sing his song,
Give him a chance to speak his piece,
Cover yourself before the next increase.
Although, as you know, he is working for hire,
He may get you in under the wire,
Don't pull that old one, can't do business with all,
Maybe you'll want to make a change before Fall.
Perhaps you will find you are in the market,
Good service and square deal may hit the target,
Give him an order if his price is right,
Whether the color is dark or light.
His cement, of course, must pass the test,
And give as good satisfaction as the rest,
Let him suggest in cloth or paper,
But bulk cement is the proper paper.
Promote the use of paper sacks,
On cloth the consumer pays the tax.
Cars should be loaded to capacity,
To prevent car shortage, this is sagacity.
Now, if for a specified job you are buying,
Sign up a contract, and save lots of crying;
See that the contractor signs one up too,
Then you will get what is coming to you.
Upon arrival of your car of cement,
Move it and make it help pay the rent.
Pay your invoices when they are due,
Or the credit department will be after you.
Take your cash discount whenever you can,
Figure it out and be a wise man,
Return cloth sacks later, don't be afraid,
Ship them well bundled and freight prepaid.
When you find some that are wet and hard,
Pass, or throw them into discard,
And when you send invoice and bill of lading,
Don't kick for full credit: Cement Company's waiting.
When received at the mill your shipment's inspected,
And a statement is issued of good and rejected,
Don't let this credit memo make you feel blue,
Even though the sacks were as good as when new.
When your car arrives in bad condition,
Be sure to get your agent's notation,
For you don't want to find in proving your claim,
That the proof you send in is decidedly lame.
Now, you yourself want a place in the sun,
And certainly want the cement mills to run,
You can help the game by playing fair,
Report irregularities, be on the square.
Follow the crowd, and boost for concrete,
For permanence in buildings, roads and your street,
When you need help to get out of the woods,
The Cement Association will be there with the goods.

New Towns and Material Business.

The present activity in the old fields of Oklahoma, with new towns springing up every few days is giving plenty of room for the play of quick action and ingenuity on the part of several line-yard concerns operating in this territory. The bringing in of a well or two of respectable size means an inrush of a horde of real estate and lease experts, drillers, prospectors, speculators—and gamblers. In a day or two a big retail market springs up with insistent calls for lumber, cement, machinery repairs, etc. In cases of fairly successful fields, a few more days sees feverish activity, rapid reckless construction on all sides, and enormous profits to concerns able to handle the business.

There are several concerns that seem to specialize in meeting such situations. They are particularly the larger line-yard concerns who have men on their forces highly trained in handling this kind of business and experts in charge who know when to establish a yard and when to sell out. The managers are usually high paid employees of proved loyalty, men who can be counted on not to break loose in a pinch for independent operation. It is good economy to pay high salaries to such managers. Profits are large but uncertain; there are enough problems to meet without putting poor managers in competition with good managers.

The mobility of these forces is admirable. Any material man would be interested in observing the speed with which lumber yards are put into commission and the ease with which managers adapt themselves to the conditions of new localities. The work is strenuous. Twelve to sixteen hours is a day's work and seven days makes up the business week. At one time last fall the rush became so great at the new town of Oiltown that the Santa Fe put an embargo upon its line. So many cars were piled up on its tracks that for about a week it refused to handle more. And all these cars were loaded with drilling apparatus and supplies.

The Long-Bell Lumber Co., with headquarters in Kansas City; the L. B. Grant Lumber Co., with headquarters in Drumright, Okla.; The American Lumber Co., Ponca, City, Okla.; the F. D. Misener Lumber Co., Tulsa, Okla.; the Kidd and Dwelle Lumber Co., Bartlesville; the Minnetonka Lumber Co., Oklahoma City, and the Spurrier Lumber Co., Cushing, Okla., seem to be equipped about the best for handling this class of business. And they seem to know when to get out of a field that is dwindling away.

SOUTH ADVOCATES FIRE PROTECTION.

Improvement in construction in the South continues to make headway and in several of the leading cities, important steps have been taken recently. Macon and Atlanta, Ga., are among the leading cities in which ordinances prohibiting wood shingles have been abolished. At Atlanta, the measure was not made as full as desired by advocates of safe building, dwelling-houses being exempted. An attempt was made at Augusta, Ga., to have repealed the section of the new building code requiring either steel sash with wire glass or fire-proof shutters on buildings as close as fifty feet to adjoining buildings, but the city council had learned its lesson from the recent big fire and refused to make any changes.

An Interesting History of Credits*

BY A. R. TRIMBLE,

President, Retail Credit Men's Association of Denver.

I sometimes wonder why is a credit man. He is perhaps the nearest approach to a personification of fear that the world has ever seen. First, he is always afraid of his job; then he is afraid of taking on a new account for fear that it will be the last straw that will prove his undoing. Then again he is afraid not to, being apprehensive of losing good business for his establishment. He is always afraid that the last check he O. K.'d is bad, and he can learn to detect the low cunning of a credit seeker in everyone who chances to pass the time of day with him. Then he is afraid that his boss will view the yearly obituary notice of the about to be interred in the cemetery of profit and loss of what were once young, promising, husky accounts, hopeful with life, that the boss will view the length of this procession and forever afterwards become suspicious of the man's judgment in such matters. Then there is that silent, potent fear of what the salesman thinks of him. For the salesman thinks as did the little girl in school. The teacher had been patiently endeavoring to impress upon the youthful understanding the rudiments of third grade physiology, and during a quiz she asked the question, "Can anyone tell me the function of the human stomach?" A little miss in the front row raised her hand, and the teacher, much gratified at the instant result of her teaching, said, "You may tell us, Mary. What is the function of the human stomach?" "Please, teacher," answered this prodigy;—"please, teacher, the function of the human stomach is to hold up the human petticoat." So, in the salesman's opinion, the chief function of a credit department is to hold up what he knows in his innocence is the most profitable business in the world, a knowledge which is based upon such pertinent and tangible evidence as that the consumer bought everything in sight, without so much as bemeaning himself or delaying to ask the price.

Business in this old world of ours has been transacted ever since Mother Eve first made the dicker with the devil, and he was, according to all accounts on the subject, the first credit man, having all the characteristics that are popularly known to belong to the present breed. Of course, he opened a bad account, we will have to admit that, and one which, according to our spiritual brothers, the world has never charged off of its books, but he did the next best thing; he made a faithful effort to collect his money, but only succeeded in turning the couple out of house and home. In those early days of business, each transaction was as individual and as simple a thing as the swapping of jack knives between school boys, merely a matter of barter and exchange, and this method prevailed for a good many centuries. We recall that this period of the world's development was largely a succession of wars. Nations would go to war for a woman's smile, or as a mere matter of difference of opinion, or as to whose god was the most loving and kind, and if for no other reason, because there had been no war for nearly six months and it was high time somebody got busy and started something.

Then there came a year of peace, and with it a great age of prosperity. The world shook itself, rubbed its eyes and stood amazed. Could it be that there was some advantage to be gained by not chopping off the head of your fellowman, and chaining his charming widow to your chariot for the next circus parade? Surely it was impossible. Nevertheless there was unmistakable evidence; men were busy with the soil, others engaged in

making things; peaceful things, shoes for the multitude, carpets for the common people, machinery for the many, books to be read; a great frenzy of industry shook the world and it had to believe that these blessings were real.

With this age of industry came a demand and a fulfillment of international commerce, nation swapping with nation. The old methods were found cumbersome and antiquated; still business was largely carried on with the restricted method of immediate cash or equivalent upon delivery. The conservative old world was running on a strictly C. O. D. basis and we have many references in the literature of the times to chests and bags of silver and gold. And to show that the genus dead-beat was even then an embryonic development, we have those doughty progenitors of Captain Kidd carrying off merchandise the same as today, with never a thought about the benign influence of the 30-day agreement, and like their present protege, treating with silent contempt all efforts to make them understand the obligation and moral necessity of settlement.

We hear of little or no credit until the development of our own country. America with its vast area, immense distances from place to place, distances between jobber and merchant, and the long delay in receiving returns, made it imperative to find some means of alleviating the shipper's anxiety, so that Mrs. Shipper could get a decent word out of him. And out of this necessity was born the agencies of Dun's and Bradstreet's, and for pioneers in the field they did valued work.

This, then, sufficed for a long time, and then wholesalers began to form associations, all kinds of associations, and nothing was more natural at their various meetings than that there should come up for discussion different doubtful accounts that troubled the sub-conscious mind, even in the face of sociability and entertainment, and there was conceived and almost instantly put into effect a rating bureau, to supplement the personal experience and opinion of the Dun's and Bradstreet's reports.

Retailer Caboose on Business Train.

Now, all of this time the poor old retailer, always the caboose on the train of business, was trailing along, depending for his credit information upon such reliable signs as to whether or not the housewife was a good-looker, or whether the husband had a tailor-made Sunday suit; or perhaps you liked the style of his hair cut; maybe he owned an equity in two lots eight miles beyond the city limits. A horse and buggy in a family in those days was good for a liberal credit, and a telephone meant an unlimited account. Of course, some of the beginners, the fledglings in business, would even go so far as to insult a customer and ask for credit reference, and be foolish enough to call up a rival concern and take the advice given. But the foxy old boys, the old-timers, knew that when told by a rival concern that a credit applicant was good, to turn him down, and if told that he was perfectly good, to lock and bar the door every time one of his family approached; and if told that the man was no good, that there at last, thank God, was an account that could safely be put upon the ledger.

This was clearly a case of history repeating itself, as tribe hated tribe and tried to exterminate each other, so merchant hated merchant and each one believed that the other was a wolf in sheep's clothing, for whom no crime was too low. But a few wise men saw the Star in the East, the great light of credit efficiency and credit coöperations

being attained everywhere by the associations of wholesale houses, and these wise men, again to repeat history, saw the advantages of peace. They realized that no matter how keen the rivalry between two competing houses might be, rivalry in credits was deadly warfare, and competition there was not the life of trade, but the death of trade; that to see a dead-beat who had stung you, sting a rival concern might be a source of some doubtful childish satisfaction, but carried with it very little remunerative value. They saw that the only way to get even was to get even with the dead-beat himself, to make him pay if he wanted to live, and compel him to be honest, in spite of his best intentions and inclinations to the contrary.

I can trace the history of the Retail Credit Men's Association of Denver, of which I have at the present time the honor of being president, and its agony of birth, the trials and tribulations of early infancy are very likely the repetition of experiences of all similar institutions.

Sixteen years ago the saner proprietors and credit men realized the dire need of such an organization. A meeting was arranged and over 250 calls sent out, and the very liberal attendance of 22 was secured. Nothing daunted, however, the ship was launched with a passenger register of 18 names. The feeling was not of security; there was no means of testing the sea-going qualities of the ship, and the crew was in no way proved or experienced, and every man on board knew that every other man had a dirk up his sleeve, ready to knife him in the back at the first opportunity. The remarks of one man are typical of the feeling which I mean. This man, who by the way is rated at nearly a million, loudly protested and asked if they thought he was going to donate with childish credulity, if they thought that he was going to give in simplemindedness the names of his good customers to be used as a mailing list by some snide rival concern, they were sadly off their base. He was not born yesterday and still in his swaddling clothes.

Now, the funny thing about this was that the ship did prove worthy, and though for many days she seemed to make no progress, little by little she caught the breeze and sailed clear of the rocks of hate, suspicion, envy and desire for revenge, and gained the open sea. Often she put to port and stripped the hide off another capture, the prize dead-beat, and this encouraged others who had been distrustful and unfriendly, and at each stop or exhibit of much a trophy, she would add one, two, or perhaps a whole score to her passenger register. Sometimes the captain and the mates would get up a smoker or a spread or an entertainment and the passengers would all come and enjoy themselves, and the good-fellowship thus engendered did much to break down the old barriers of the past. They came to look upon each other not so much as wolves, but greatly to their surprise, found that each one was a human being, and oftentimes a royal good fellow, and the friendships started did much to bring the backbone of the city, the retail merchants, together, and there was born a great spirit of civic pride. They began to realize that each one had the same troubles, the same difficulties, the same obstacles to overcome, and that their object must be the same. They builded together; they were all members of one body, and while competition is all right to keep the blood pounding through the arteries of trade, yet no body could be healthy and have some of its members withering and decaying, nor could this condition exist without reacting on the entire body and every one of its members.

Credit Men Responsible for Bankruptcy Law.

This getting together and all putting their shoulders to one wheel did a great deal in forcing beneficial laws through unwilling legislatures. How many here realize that our present bankruptcy act is the result of many years' warfare waged by the

*An instructive lecture on this important subject before the Retail Merchants' Association of Colorado.

National Association of Credit Men, to whom I take off my hat, as were many other state laws, put upon our statute books by such associations as ours, being effective weapons placed in the hands of merchants for hunting down the man who will not pay his bills.

At first the sharks were little troubled. This menace to their existence was such a futile thing; but from everywhere upon this sea of credits was being launched ship after ship of the association, and when from an intended victim he received the harpoon of a sharp turndown or the blow of a bland refusal, the shark began to understand that somewhere, somehow, there was being kept a chronicle of his life as inexorable as that of St. Peter, with this difference: that he had to pay, instead of pray, to keep his record clean. With this forcing of him to be honest, as years roll on, has marked a new standard of ethics in business, a much higher standard, if you please. People tell us that ethics never change, that right was always right and wrong was always wrong, but at one time it was a baron's right to pay no taxes on the land he owned. At one time, in our own country, it was right and honorable to hold in bondage a fellow human being. A very short time ago it was right and of good business principle for the large creditors to force a little merchant to the wall and let the small creditors whistle for their money.

No, gentlemen, right is a matter of time, and we are getting better every day. To believe this, we only have to look about and see that the business of the world is today practically done on credit. That out of the two hundred billions of dollars' worth of business done every year in the United States, only one out of every 27 is represented in cash equivalent. One hundred years ago this would have been impossible; 50 years ago it would have been a dangerous bubble. Today it is a solid fact. This immense structure, this imposing edifice of credit, is founded on what? On collateral? No; collateral is credit. On securities? No; securities are credit. On property holdings? No. What then? Why, something far deeper. Something that has its foundation on the bedrock of all permanent building—the character of our people, their moral worth, their right motives and right intention, and the realizing by a very vast majority of them that an obligation is an obligation, whether it be to their God or to their grocer.

NEW YORK LIEN LAW AMENDED.

New York, June 18.—Considerable discussion has been given building material men of late regarding the possible effect of the amendments to the Mechanics' Lien Law and how it will operate in the building material line. Speaking on this subject Wright D. Gross, president of the Empire Brick and Supply Co., said:

"The old lien law, which has become well settled by judicial interpretation of the courts, placed building material men and laborers in a preferred class. The amendments, which have just been passed by the legislature, will require the test of experience to prove to just what extent they are an improvement over the old law.

"The provisions giving to the building material men, sub-contractors and laborers priority over general creditors on particular operations is proper and should meet with general approval. Another provision making it possible for seventy-five per cent in amount of mechanics' liens creditors to arrange for the completion of an operation which is in financial difficulties ought to prove beneficial.

"Lien laws should not be made to foster greater laxity in the granting of credits, and it will be of interest to know whether under the new conditions, there will not develop a trend on the part of loan operators in conjunction with material men con-

tractors to take increased risks in promoting what are known as speculative operations. It would prove best for all interests if this speculative tendency could be restrained rather than greatly encouraged."

J. C. Ludlum, representing a large speculating builder, commenting upon the new law said:

"Conditions have been against the speculative builder for a long time. This new lien law ought to give the legitimate speculative builder a new change in this market. There are numerous instances where speculative work has been held back of late because of high prices, heavy loan restrictions and lack of adequate protection in the matter of lien laws. The new amendments may be the means of opening up the building movement in this city this year and next that will make this city have its proper place in the heavy building gains reported elsewhere throughout the country. Adverse conditions are acting as a dam against the current of prospective building that has been on the verge of projection for almost a year and those who have an ear to the ground can detect the rumblings of a better market for building labor and materials, as a result of this amendment, than has been noted in some time. We have been too long accustomed to consider Manhattan as New York and just because certain sections of Manhattan have been over built lobbying has followed in Albany that has shut off profitable building in other boroughs. I believe all boroughs will have a fair chance under the new law."

HOLLOW TILE REVIVES MISSOURI TOWN.

An example of what a live progressive firm can do, no matter in what line of business it is engaged, is shown by the improvement in the construction of buildings and homes in Columbia, Mo. One year ago not a house in that city was constructed in any part with tile. Since then the efforts of the Edwards Brick Co. have been placed to such good advantage that during the past twelve months, seventy-five per cent of the money that was put into houses was spent on tile. Every residence constructed was a good one, several fraternity houses and one large apartment house being included. The Edwards Brick Co.'s advance has been coincident with the erection of better dwellings and office buildings in Columbia.

That firm has recently equipped its yards with appliances which will allow it a daily capacity of 30,000 face brick. Heretofore, it has not done any manufacturing of face brick, but after the installation of the new equipment, has taken rapid steps along this line. At present, the lower vein of shale is being worked, being burnt very easily, right above the coal.

Harry J. Benning, for some time past connected with the Santa Fe Polish Co., Santa Fe, New Mexico, is now sales manager of the Edwards Brick Co.

RETAILERS' TRANSPORTATION COMPANY.

Through the purchase of four three-masted schooners by Paul E. Chalifoux, treasurer of the Kirkpatrick Sand & Cement Co., of Birmingham, Ala., that company, as well as other Birmingham concerns, will be enabled to ship their products to Cuba, Mexico, Central and South America. Southern business men have found since the war started that the question with them was not so much of getting business from the countries south of the United States, but of obtaining transportation. The purchase of these boats by Mr. Chalifoux is a big step toward increasing trade between Southern manufacturers and the Latin-American countries, particularly as it is to be followed by additions to the fleet. A 100-ton self-propelled sea-going barge is being planned for the near future. The Mobile Navigation Co. is to be organized to take over

these boats as well as several river vessels owned by the Southern Fuel & Material Co., Mobile agents of the Kirkpatrick company. While the big steel mills of Birmingham are anxious to ship freight by these schooners, Mr. Chalifoux intends them primarily for cement, and building materials.

BREVITIES OF THE RETAIL TRADE.

The Consolidated Builders' Co., Chicago, Ill., capital \$2,500; incorporators, Margaret Corrigan, Samuel Grossman, Elsie Frankenhush.

Alley Bros., New York, N. Y.; capital, \$15,000; building supplies, etc.; incorporators, Edw. S. Alley and others.

Florida Builders' Supply Co., Jacksonville, Fla., capital \$30,000; incorporators, T. W. Mitchell, president; L. S. Gaulden, vice-president; D. Kimball, secretary-treasurer.

The T. H. Clark Lumber Co., Akron, Ohio, capital \$50,000; to deal in lumber and building materials; incorporators, T. H., D. W. and F. D. Clark and others of Akron, O.

Alpine Construction Co., Newark, N. J.; object, to deal in building materials; capital, \$2,000; incorporators, Abraham Koeppel and Mark S. Feiler, of Brooklyn, and A. Haas, of Jersey City.

Bay Holding Co., Manhattan, N. Y., general building and construction business, capital \$10,000; incorporators, Louis Yavno, Max Bernstein, Arthur Greenbaum, Manhattan.

The plant and yards of the Citizens' Lumber Co., at Parkersburg, W. Va., one of the big dealers in builders' supplies and lumber in that city, were burned June 11, with a loss of \$200,000. It is likely that the plant will be rebuilt at once.

The Scott Lumber Co. of Bridgeport, Ohio, which is one of the largest lumber and builders' supply concerns in the Buckeye State, is putting in a new yard in Warwood, W. Va., under the direction of Leslie Winters of the Bridgeport plant.

The Cincinnati Clay Products & Supply Co., according to John M. Stoner, its president, is handling a very satisfactory volume of business, sales running considerably ahead of last year, which was a good one, so that it looks as if 1916 is going to be a banner year.

The Santa Fe Builders' Supply Co. has been organized to take over the business of the Santa Fe Lumber & Transfer Co. New departments will be added. The new incorporation has an authorized capital stock of \$80,000, the incorporators being, F. E. Nuding, Charles Proebstel and W. H. Hahn.

Houston Bros. Co., Pittsburgh, Pa., is having an unusually busy month in June, and its shipments and orders are both showing big totals. The company's yards never had a more busy appearance than this summer, and its officials report business in general very satisfactory.

The Associated Building Materials Co., Los Angeles, Calif., capital, \$10,000; incorporators, H. J. Harrison, Harry W. Logan and Carl H. Zeus. The company has offices at 402 Metropolitan building, Los Angeles. Beside representing a number of manufacturers of building materials, the company operates the Mulford brick plant at Montebello, Cal., manufacturing brick and hollow tile.

Building material men were very much interested in the news from Baton Rouge, La., that the Louisiana Railroad Commission had permitted a reduction in freight rates on gravel. In the parish of Ouachita alone the saving will mean thousands of dollars, as two new road districts were created by the police jury shortly before the reduction went into effect. Rates on gravel for road purposes for a twenty-five mile haul formerly was \$12 a car and now is reduced to \$8, a saving of \$400 per mile in gravel road construction. Similar reductions have been made in longer hauls.

Association News

Important Communications and Notices from Officials of the Various Organizations and Records of Recent Happenings

James H. Allen, President, National Builders' Supply Association, Lincoln, Neb.
 Charles M. Kelly, President, New England Builders' Supply Association, Providence, R. I.
 Frank H. Genung, President, Mason Material Dealers' Association of New Jersey, Newark, N. J.
 W. O. Holst, President, Ohio Builders' Supply Association, Toledo, O.
 B. L. Grove, President, Del-Mar-Col Builders' Material Dealers' Association, Washington, D. C.
 H. E. Shadle, President, West Virginia Lumber and Builders' Supply Dealers' Association.

Michigan Retailers Meet.

Two meetings of retailers in the state of Michigan were held under the auspices of the National Builders' Supply Association during the past fortnight. On Tuesday, June 13, a meeting of the dealers in the Grand Rapids district was held in the Association of Commerce rooms at Grand Rapids. On the following day a meeting of the retailers in the neighborhood of Kalamazoo was held at the Park Hotel. Both these meetings were held during the afternoon.

The Grand Rapids Meeting.

The Grand Rapids meeting was called to order by A. B. Knowlson, chairman of the district committee, at 2:30 p. m.

Haydon S. Gaines, field secretary of the National Builders' Supply Association, was the first speaker on the program and gave a brief but complete history of the association movement during the past seventeen years. He described in detail the district plan of organization and told of the success of this plan in Indiana and Wisconsin. His closing remark, which was dramatically put, contained the words, "We are here to help you make more money out of your business."

Walter M. Hildebrand, of Staples-Hildebrand Co., chairman of the South Bend, Ind., district and a director of the association, told of the experiences of retailers in his district. He stated that the dealers were often organized but never on a practical basis. The credit basis of the present plan has proven practical and, as Mr. Hildebrand stated, "money is coming in a whole lot easier than it used to." The old system of extending credit over a period of eight or nine months is now a thing of the past. Instead of doubt and suspicion a noticeable feature among the retailers of his home district is the honest manner in which they treat one another.

Mr. Hildebrand urged all of the retailers present to affiliate with the National Builders' Supply Association and assured them of splendid returns on the investment. He stated that he was certain that his firm had benefited to the extent of \$100 for every dollar paid in dues.

George A. Olsen, of ROCK PRODUCTS AND BUILDING MATERIALS, spoke on the cost of doing business, credits, harmony in the ranks of retail dealers and co-operation in the sale of building materials.

The retailers present were then given an opportunity to ask questions pertaining to the association movement and these were answered by Mr. Gaines. During the afternoon session a few new members were added to the association.

Those present at the meeting were as follows:

Harry Elenbaas, M. J. Elenbaas & Sons, Grand Rapids, Mich.
 A. B. Knowlson, A. B. Knowlson Co., Grand Rapids, Mich.
 Jacob S. Westra, Battles Fuel & Building Material Co., Grand Rapids, Mich.
 Wesley E. Dyer, The Wiseloge Co., Muskegon, Mich.
 Nicholas H. Battles, Standard Builders' Supply Co., Grand Rapids, Mich.
 S. G. Schaafsma, The Brummeler-Van Strien Co., Grand Rapids, Mich.

Jake Reimick, Reeman, Mich.
 L. M. Bettis, Mansfield-Bettis Lumber Co., Ravenna, Mich.
 A. E. Young, Ravenna, Mich.
 G. M. McCutcheon, Sand Lake, Mich.
 W. H. Edwards, Edwards Lumber Co., Muskegon, Mich.
 Charles A. Floyd, Construction Supply Co., Grand Rapids, Mich.
 M. P. Louwerse, S. A. Mormon & Co., Grand Rapids, Mich.
 David Smith, Smith Bros.-Vette & Co., Lake Odessa, Mich.
 M. Heuman, Penninsular Portland Cement Co., Jackson, Mich.
 Will Burns, Fremont Lumber & Fuel Co., Fremont, Mich.
 John Jasperse, Grand Rapids, Mich.
 P. Jonkma, Welmur Dykma Co., Grand Rapids, Mich.
 Walter M. Hildebrand, Staples-Hildebrand Co., South Bend, Ind.



E. R. SULLIVAN, SALES MANAGER, PEERLESS PORTLAND CEMENT CO.

Haydon S. Gaines, National Builders' Supply Association, Chicago, Ill.
 George A. Olsen, ROCK PRODUCTS AND BUILDING MATERIALS, Chicago, Ill.

The Kalamazoo Meeting.

At the request of Chairman F. B. Johnson, Mr. Gaines presided at the Kalamazoo meeting. He opened the session with a few remarks about the National Builders' Supply Association and association work in general. He called upon W. H. Jones of Kalamazoo, who had studied the district plan of organization as outlined by the National.

Mr. Jones said, in part: "There is no business which can be conducted without an organization. Through an association, a retailer will secure information which will prove of value to him and will aid him in getting a fair profit on the material he sells. I am convinced that when you once get into an association of this nature you will be more than satisfied to stay."

Mr. Olsen gave a brief review of the activities of the National Builders' Supply Association and spoke on the part that ROCK PRODUCTS AND BUILDING MATERIALS is taking in effecting this organization.

T. S. Pabst, of the Universal Portland Cement Co., spoke on the attitude of the manufacturers toward association work and quoted from the address of E. N. Hurley of the Federal Trade Commission before the recent meeting of the Association of American Portland Cement Manufacturers at Chicago. He discussed the necessity of knowing what it costs to do business and offered the suggestion that it might prove profitable to pass information on this question on to competitors.

E. R. Sullivan, sales manager of the Peerless Portland Cement Co., when called upon stated that it was the first time he has ever been asked to address a gathering of dealers. He stated that his firm had sent out circulars to dealers, promising protection, in the sale of Peerless Portland cement and gave a very interesting, though short, talk on the attitude of his firm toward the handling of cement by retailers.

W. E. Cobean, sales manager of the Wolverine Portland Cement Co., stated that the experience his firm has had since the organization of district committees in Indiana was so good that its officers were in hearty accord with the plan to extend the work in the state of Michigan. He stated that it was his opinion that a national association, made up of local district committees was the best kind of an organization, providing the district meetings were held monthly or oftener. He recited the experiences of cement salesmen of a short time ago in an interesting manner when he alluded to the way in which they were afraid to meet each other and whenever possible would pass on opposite sides of the street. He stated the policy of his company as being in favor of selling Wolverine Portland cement through the legitimate dealers of the country.

M. Heuman, of the Peninsular Portland Cement Co., stated that his firm was anxious to cooperate with retailers and mentioned specific instances in which this cooperation policy is being carried out for the benefit of the retailer.

Mr. Hildebrand brought up a few reminiscences of the days when the average dealer would say to his contractor, "That's as low as I can get and if any other dealer can get lower, I know he is not making money out of the sale."

"We have tried to solve all of the little perplexing problems that come up in our district," said Mr. Hildebrand. "A friendly feeling now exists and, due to a systematic study of conditions, prices on the various commodities are about the same. In studying these conditions we have considered service charge, overhead charge and everything else that enters into the price we are compelled to ask."

He stated that as a result of this study of conditions the market has been stapleized and the contractors do not travel from one dealer to another saying, "I can get it lower elsewhere." "He knows better than to do that," said Mr. Hildebrand. "We no longer depend on the mechanic's lien law for our security since we have adopted a uniform method of handling credits. The entire change has been brought about through our affiliation with the National Builders' Supply Association."

F. L. McClintic, sales manager of the Burt Portland Cement Co., spoke of the attitude of his company toward the dealer and approved the district plan of organization adopted by the National association. It was the first time that he had appeared before a body of building dealers and the talk was very interesting.

Fred J. Wells, of Battle Creek, spoke on the necessity of figuring overhead into every sale and of the demoralized effect on business for a firm with large capital to sell building materials without this knowledge. He paid a compliment to manufacturers of Portland cement and other building ma-

materials for the fair manner in which they have been treating the retail trade. He offered the services of his firm in an endeavor to bring all of the dealers in and near Battle Creek into the association.

J. E. Nichols, at Allegan, discussed the farmer as a business man and the attitude retailers should assume toward the farm trade.

After a thorough explanation of the district plan by Mr. Gaines, a number of firms joined the organization.

Those present at the Kalamazoo meeting were:

W. M. Hazen, Three Rivers, Mich.
 Peter Molhoek, Kalamazoo, Mich.
 B. Van Rochove, Van Rochove & Sons Manufacturing Co., Kalamazoo, Mich.
 Fred J. Wells, Rathbun & Craft Lumber & Coal Co., Battle Creek, Mich.
 F. M. Hicks, S. H. Buurma, Kalamazoo, Mich.
 M. Heuman, Peninsular Portland Cement Co., Jackson, Mich.
 E. C. Nichols, Union Trim & Lumber Co., Kalamazoo, Mich.
 J. E. Nichols, Griswold & Nichols, Allegan, Mich.
 F. B. Godfrey, Godfrey Lumber Co., Kalamazoo, Mich.
 W. H. Jones, North Lumber & Manufacturing Co., Kalamazoo, Mich.
 F. B. Johnson, Johnson-Howard Co., Kalamazoo, Mich.
 E. H. Neher, Celery City Lumber Co., Kalamazoo, Mich.
 Walter M. Hildebrand, Staples-Hildebrand Co., South Bend, Ind.
 W. E. Cobean, Wolverine Portland Cement Co., Coldwater, Mich.
 C. R. Howard, Johnson-Howard Co., Kalamazoo, Mich.
 Casper H. Haas, Kalamazoo, Mich.
 S. H. Buurma, Kalamazoo, Mich.
 E. A. Haven, Bloomington, Mich.
 H. L. North, North Lumber Manufacturing Co., Kalamazoo, Mich.
 T. S. Pabst, Universal Portland Cement Co., Chicago, Ill.
 J. M. Smith, Marcelles, Mich.
 G. A. Hauke, Universal Portland Cement Co., Chicago, Ill.
 W. P. Thompson, Augusta Lumber Co., Augusta, Mich.
 E. R. Sullivan, Peerless Portland Cement Co., Union City, Mich.
 F. L. McClintic, Burt Portland Cement Co., Bellevue, Mich.

SEWER PIPE MEN ADDRESS MEETING.

Sewer pipe was the principal topic of discussion at the monthly meeting of Local District Committee No. 2, Indiana division of the National Builders' Supply Association, held at the Wayne Hotel, Fort Wayne, Ind., on Thursday evening, June 15.

Representatives of the various sewer pipe manufacturers shipping into the Fort Wayne district had been asked to attend the meeting and, after an opening address on the question of retailing sewer pipe by Chairman Theodore Schwier, Gus Armstrong, of the Thompson-Armstrong Co., Cincinnati, O., addressed the meeting on the attitude of selling this product to the retail building material dealers. He stated that his company was "strong," for the district plan of organization and in favor of selling its products through the legitimate channels of the retail dealer.

Art Hayes, of the Robinson Clay Products Co., Akron, O., gave quite a lengthy talk in which he gave his views of the situation and also asked the members of the National Builders' Supply Association to aid pipe manufacturers in maintaining prices instead of trying to get some salesman to break the market price and thereby help demoralize the sewer pipe market.

The main address of the meeting was made by Haydon S. Gaines, field secretary of the National Builders' Supply Association, who delivered an extremely interesting and well prepared talk upon organization work. He recited his experiences in organizing the various districts of Indiana, Wisconsin and Michigan and told of the enthusiasm which takes hold of retailers wherever the plan is given a trial.

During the meeting, Secretary C. E. Ellenwood reported another retailer has been added to the membership of the association in the firm of the North Manchester Lumber Co., North Manchester, Ind. This makes thirty-seven members now affiliated with local district No. 2.

The attendance at this meeting was as follows:

F. H. Moellering, Wm. Moellering's Sons, Ft. Wayne, Indiana.

E. M. Baltes, E. M. Baltes & Co., Ft. Wayne, Ind.
 Theodore Schwier, E. M. Baltes & Co., Ft. Wayne, Indiana.
 H. F. Fishack, Fishack-Ellenwood Co., Ft. Wayne, Indiana.
 C. E. Ellenwood, Fishack-Ellenwood Co., Ft. Wayne, Indiana.
 Charles Jocquel, Jocquel-Schulz Co., Ft. Wayne, Ind.
 Chris. Schulz, Jocquel-Schulz Co., Ft. Wayne, Ind.
 C. W. Addington, Robt. Hixon Lumber Co., Garrett, Indiana.
 O. Spangler, Spangler & Grosloff, Churubusco, Ind.
 J. Steiner, Huntertown Grain Co., Huntertown, Ind.
 Jess. Sellemeyer, Kirach, Sellemeyer & Sons, Decatur, Indiana.
 George Tribolet, Ossiar Lumber Co., Ossiar, Ind.
 E. Schnelker, Elastic Plaster & Coal Co., New Haven, Ind.
 Julius Gerig, Grabill Lumber Co., Grabill, Ind.
 J. Lamm, S. O. Lamm & Son, Butler, Ind.
 Otto Stuckey, Berne Lumber Co., Berne, Ind.
 Glad Hendry, L. A. Hendry & Son, Angola, Ind.
 H. Dinius, A. Wasmuth & Sons, Roanoke, Ind.
 F. Bash, Bash & Co., Huntington, Ind.
 S. E. Kessler, Columbia City, Ind.
 J. W. Garman, Home Lumber Co., Huntington, Ind.
 Mr. Wells, North Manchester Lumber Co., North Manchester, Ind.
 Mr. Torkler, Evans Clay Co., Ulrichsville, Ohio.
 Art Hayes, Robinson Clay Products Co., Akron, Ohio.
 Mr. Dickson, American Sewer Pipe Co., Akron, O.
 Mr. McDowell, Logan Clay Products Co., Logan, Ohio.
 Gus Armstrong, Thompson-Armstrong Co., Cincinnati, Ohio.
 Paul Wagner, Thompson-Armstrong Co., Cincinnati, Ohio.
 Mr. Donaldson, Bestwall Manufacturing Co., Chicago.
 L. C. Kelley, Peerless Portland Cement Co., Union City, Mich.
 Charles Brigham, Atlas Portland Cement Co., New York.
 Haydon S. Gaines, National Builders' Supply Association, Chicago.

DEALERS AND CONTRACTORS MEET DAILY.

The Builders and Traders' Exchange of Detroit have made arrangements with the restaurant in the Penobscot building to have a certain portion of the eating establishment set aside for the exclusive use of Exchange members and their friends between the hours of 11:30 a. m. and 2 p. m. This will give dealers and contractors an opportunity to meet more regularly and fraternize more freely than heretofore. The Exchange, in conjunction with the Michigan Society of Architects, will hold its annual outing at Put-in-Bay, Ohio, on June 28.

NEW ENGLAND BUILDERS' SUPPLY ASSOCIATION.

Providence, R. I., June 5, 1916.

Editor ROCK PRODUCTS AND BUILDING MATERIALS:

Having reference to the campaign which is being carried on by the National Builders' Supply Association for an increased membership, and which has been very successful in the middle west, I will state that I believe that the president and the secretary of this association are entitled to considerable credit because of the success of the effort.

Speaking for myself I believe that there is a strong need of the National association to work in conjunction with local associations for the betterment of the dealers who are engaged in the sale of masons' materials.

At the same time it is difficult in certain localities to enthrone the membership to believe as an individual does who has had the advantage of talking personally with the dealers in other localities where the experiment has been tried.

The National association has never been strong in the New England states, and I believe that one of the causes for this weakness is the fact that when it was organized its principal object was to obtain its membership from the large dealers, and the smaller dealer learned to look upon the organization as not for his benefit in any way.

The secretary of the National association very kindly appeared before the executive committee of the New England association and explained in full detail their plans and policies, and this matter has to be taken up later at the full meeting of the executive committee for the purpose of making some recommendation to the general membership.

While it is impossible for me to state at the present time as to how this plan will be considered by them, I personally wish the officers of the National association the greatest measure of success, and I also believe that the thanks of the entire building industry are due to the management of

ROCK PRODUCTS AND BUILDING MATERIALS for the interest that they are displaying in this campaign, and for all that they have previously done which has been for the benefit of the material dealers.

CHAS. M. KELLY, President,
 New England Builders' Supply Association.

WORLD'S SALESMEN TO MEET AT DETROIT.

"Business Betterment Through Betterment in Salesmanship" has become the slogan of the World's Salesmanship Congress to be held in Detroit from July 9 to 13, inclusive. The scope of the Congress is world wide. Its committees embrace successful business men of national prominence. Its program is being built up from suggestions received from every section of the earth. Every civilized nation will be represented at its sessions. Women will be as conspicuous in its activities as men. Salesmen will conduct as many of the meetings as sales managers. Approximately one hundred lectures and discussions will be held. Concrete resolutions will be adopted as a result of these talks. Entertainment will be provided of a nature in keeping with the universal comprehensiveness of the convention. Finances far in excess of the needs of the congress have already been supplied. The president of the United States has signified his willingness and desire to address the opening meeting.

Salesmen representing all lines of the building material industry are showing an interest in the congress and are planning to attend. Blaine S. Smith, general sales manager of the Universal Portland Cement Co., is a member of the executive committee. He is urging as many of the salesmen and sales managers as possible to attend the congress and through the knowledge gained there elevate the system of selling building materials.

CANADIAN CONDITIONS IMPROVING.

Toronto, June 16.—Practically all the dealers agree that the largest volume of trade is coming from the smaller towns. In Toronto, however, there are a great number of large buildings either under construction or contemplated. It was pointed out to the writer that there are a great number of factory buildings under construction and Andrew J. Eken, Vice-President of the George Fuller Construction Co., states that "there is more building in prospect in Canada at the present time than has been in sight since before the war. The buildings consist of factories, warehouses, elevators and hotels. At least six big elevators are to be erected in Canada this year including another for the Montreal Harbor Commission.

In regard to the cost of construction there has been a recent advance in many materials. Brick has advanced about two dollars a thousand, steel has also increased in price, due to the great demand for steel for shells, and labor costs more on account of so many men enlisting. Lumber and nails, builders' hardware have also increased in price. There is not much doing in the house building line but the manufacturers must have space to take care of increasing trade and they are forced to build. On this account the figures for June will compare very favorably with the same month last year and in Toronto at least, if the present rate of taking out permits, is maintained will surpass last year.

A novel use of the concrete block in foundations has been developed by the Bertrand Lumber Co. of New Orleans, La. New Iberia is in the heart of the sugar country and plantation cabins are the chief type of abode. These cabins have been placed on cypress blocks spaced about six feet apart. Decay of a corner block invariably meant disaster. Mr. Bertrand is making a concrete block for the purpose of utilizing broken glass, bats from his brick pile and any other solid debris around his yard for aggregate. He has brought the price down until he is doing a rushing business.

NEWS of the TRADE

BUILDING OPERATIONS MAKE HUGE ADVANCE.

Building and engineering operations in New England, New York, New Jersey, Pennsylvania, Maryland, Delaware, District of Columbia, Virginia, Ohio, West Virginia, Indiana, Illinois, Iowa, Wisconsin, Michigan, Minnesota, North and South Dakota and portions of Missouri and eastern Kansas, for the period from January 1 to June 1, 1916, as reported by the F. W. Dodge Company, show that such operations in the period reported reached a total of more than \$100,000,000 in excess of those reported for the corresponding period in 1915. Building and engineering operations in the period reported for 1916 totaled \$456,101,500, while for the same period a year ago the total was \$321,241,100, a difference in favor of the current year of exactly \$134,860,400.

The operations, represented by contracts awarded, for the six months from January 1 to June 1, 1914, totaled \$300,721,000; for 1913 the total was \$379,001,500; for 1912, \$327,015,000; for 1911, \$339,167,813, and for 1910, \$366,037,505.

Comparative statistics of building and engineering operations in eastern Pennsylvania, southern New Jersey, Maryland, Delaware, District of Columbia and Virginia, as compiled by the same authorities and represented by contracts awarded, are as follows.

Contracts awarded January 1 to June 1, 1916,
\$68,543,000.

Contracts awarded January 1 to June 1, 1915,
\$37,263,000.

Contracts awarded January 1 to June 1, 1914,
\$42,562,000.

Contracts awarded January 1 to June 1, 1913,
\$32,883,000.

Contracts awarded January 1 to June 1, 1912,
\$57,260,000.

Contracts awarded January 1 to June 1, 1911,
\$44,417,500.

Contracts awarded January 1 to June 1, 1910,
\$44,519,000.

MAY PERMITS SHOW BIG GAIN.

The best monthly statement of building operations throughout the country since last January is that for May, which has just been compiled. The official reports of building permits issued in 108 principal cities of the United States, as received by the American Contractor, Chicago, total \$13,904,515, as compared with \$8,649,129 for May, 1915, an increase of 32 per cent. Not only is there a favorable showing in the value of the new structures, but in their number also, the total number of permits issued in May this year being 31,877 against 25,608 for May, 1915.

This showing is especially gratifying in view of certain conditions which have tended to retard construction work recently. The extreme difficulty in procuring early deliveries of structural steel on account of the tremendous activity of the metal markets has resulted in postponing work on skyscrapers and other types of buildings, requiring considerable amounts of metal, delays which have no doubt been intensified to some degree by the sharp advance in the price of the industrial metals.

But in spite of that handicap, present activities, as indicated by the May reports, are far ahead of the construction work in progress a year ago.

It will be noted also from the table below that the larger cities, those in which the erection of steel construction buildings is relatively the greater, show gains instead of losses. New York, Chicago, Philadelphia and many of the other metropolitan toptopners are listed with decisive gains to their credit. Of the 108 cities included in the list, 77 show gains and only 31 comparative losses.

For the first five months of 1916 the building permits issued in these cities total \$393,018,536, as compared with \$317,373,988 for the corresponding period last year, an increase of 24 per cent.

The details of the May statement follow:

[illegible]

GREAT ACTIVITY AT KANSAS CITY.

Public work is opening up in Kansas City, Mo., this summer on a large scale. The board of public works has let contracts for concrete pavement covering many blocks. The park board is also letting many contracts, all its paving being bituminous macadam. The engineering department is preparing to increase its force to prepare surveys and plans for extensive sewer improvements. Harring-

NEW YORK MARKET BRISK.

New York, June 17.—Radical price changes have occurred in many basic materials. Dealers have put the price of Portland cement, delivered from yard, up to two dollars a barrel. Rosendale cement is now quoted at \$1.25 a barrel, delivered. Finishing lime is selling at two dollars a barrel and common at \$1.70. Screen, washed, cow bay sand is now selling at fifty cents a yard, flat.

Crushed trap rock in three-quarter inch size is selling at prices higher than have ruled here in ten years. The current quotation is \$1.15@1.25 a cubic yard and the manufacturers cannot produce it fast enough for the demand.

Blue stone crushed, is selling here at ninety to ninety-five cents a cubic yard and one dollar is being asked for crushed three-quarter inch size.

Clay products interests, notably, those dealing with fine linings, clay conduits, copings, drain tile and sewer pipe expect to report new quotations in the first of July by a change in discounts which will make a slight advance over quotations heretofore ruling.

It is notable, that while quotations have been advanced to the consumer, the financial market has shown a retracting tendency. The United States has recently absorbed something like a billion dollars worth of American securities held abroad and there is still more in London that will be liquidated. Money on mortgage loans is not so easy as it was three months ago in this market. The two conditions are associated in the minds of many big builders who have been trying to ascertain why so many building operations are being held back.

In the light of this increasing demand for new commercial and mercantile construction and the adverse twist to the financial market, big builders see only one of two solutions: sharp shading of prices in steel leads the prices of other materials down again or the wider use of decidedly inferior materials with consequent quicker depreciation.

MARKED ACTIVITY IN EAST ST. LOUIS.

East St. Louis, Ill., June 20.—With the Aluminum Ore Co. heading the list by the construction of a six-story office building and virtually every industrial plant expending amounts from \$5,000 to \$50,000 on improvements, this season promises to be a prosperous one for East St. Louis. The building permits for the first half of June show a considerable gain over June of last year, and a number of important building operations are expected to begin before the first of July.

The Aluminum Ore Co. is now engaged in construction work to cost about \$75,000 when complete. The new office building will be an addition to the present structure and will be of modern construction.

According to information received from Dr. E. F. Little, postmaster of this city, the postoffice department will begin at once to make improvements on the East St. Louis postoffice to the amount of \$240,000. The appropriation provides for the erection of an east and west wing on ground now owned by the government.

CHICAGO MARKET CONTINUES ACTIVE.

Permits for structures to be built in Chicago continue to be issued at a very interesting rate. During the week ending June 17 there were 198 permits issued for structures to cost \$2,721,700. This is a gain of 18 permits and a valuation of \$810,200 over the same week last year.

Due to the low rates of interest prevailing in this market large sums of money are being borrowed to finance the construction of new buildings for homes as well as for larger structures.

An eight-story fireproof apartment hotel will be erected on the lake shore at the northwest corner of Lakeside place, to cost \$350,000, by Paschen Bros. Construction will be commenced just as soon as the present suit concerning the riparian rights is disposed of.

Robert Goldstein and Henry Friedman have purchased the vacant land in Eastwood avenue, 79 feet west of Clarendon avenue, north front, upon which they will shortly begin the construction of a high-grade six-story fireproof apartment building to cost \$250,000. It will contain sixty-three apartments. There will be a roof garden overlooking Lake Michigan. Plans for the building have been prepared by Architect John A. Nyden.

The Majestic Tailoring Co. will construct a six-story building to cost \$90,000, which they will occupy with their tailor-to-the-trade business.

GRAND RAPIDS BUSINESS FAIR.

Grand Rapids, Mich., June 19.—Building material dealers here all seem to be busy, although a few of them say that business is not as good as it should be. The building of homes in subdivisions recently opened is taking large quantities of materials, and the few large buildings in course of construction in the downtown district are keeping scores of teams busy delivering cement, lime, plaster, sand, gravel and the other commodities out of which they are being built.

A. B. Knowlson, of A. B. Knowlson & Co., reports a fair demand for all materials, as does S. A. Morman, of S. A. Morman & Co. Jacob Westra, of the Battjes Fuel and Building Material Co., says that conditions are fine. Nicholas Battjes, of the Standard Fuel and Builders' Supply Co., reports a steady demand, with perhaps a little extra spurt on concrete building blocks.

Charles A. Fyold, of the recently organized Construction Supply Co., says that his firm is getting under way very nicely. Offices of this company have been established in the Pantlind hotel building.

GRAND RAPIDS MARKET HEALTHY.

Grand Rapids, Mich., June 19.—There is a healthy demand in Grand Rapids for sand and gravel. Torpedo sand and what is termed in this market "reinforcing gravel" (one-quarter to one inch) are easily disposed of. Prices for all sizes are fair to good. Practically all of the plants are running to capacity.

KALAMAZOO GRADUALLY PICKING UP.

Kalamazoo, Mich., June 19.—Kalamazoo is gradually overcoming the conditions thrown upon it recently through the shutting down of several large manufacturing plants. The number of vacant stores and dwellings is being reduced and some new structures are in the course of erection. The downtown district has taken on a healthy appearance through the building of additions to hotels and a few other structures. Dealers report a fair demand from city and farm trade.

The West Virginia Paving & Pressed Brick Co. has just completed the last of three down draft, modern brick kilns at its plant in Huntington, W. Va.

CONDITIONS IN THE CENTRAL WEST.

Kansas City, Mo., June 19.—The high price of materials and unrest in labor circles have not had any effect on construction activity in this section of the country. Aside from work that is actually tied up, big projects are being rushed through to completion. Work reported in the most recent issue of a western contractors' publication, on which dates for taking bids are specified, totals \$1,600,000. These figures represent work of all classes. Levee work represents a goodly item. Municipal improvements, schools, churches and private projects are all represented. If labor troubles do not become more acute than they are at the present time the next few months will do much toward making 1916 a record breaking year.

The outstanding feature of the materials markets was another advance of ten cents per barrel in the price of cement. The surplus stocks of the cement companies have been down to a very low ebb and the persistency of the demand has justified the new basis of \$1.25 at the mill. The practice of western manufacturers, inaugurated late last year, of giving retailers five days' notice of an advance results at this time in a tremendous rush of business. All retail stocks are at the present time filled to overflowing and it will be several weeks before movement picks up again.

While the present price is in sharp contrast with the low market of a year ago, dealers as a rule do not complain that it is too high. They recognize that the business in the past has not been healthy and that the manufacturers are entitled to a long period of better than dollar prices. All that they ask is that the market be kept as uniform as possible. They can sell as easily at seventy cents per sack as they can at forty cents. What they object to is the necessity of alternately raising and lowering. The prospects now are that they will not be obliged to lower their prices this year.

The Kansas City strike has now reached the advertising stage. The Building Trades Council and the General Contractors' Association are presenting their claims through the advertising columns of the daily papers.

NASHVILLE RETAILERS BUSY.

Nashville, Tenn., June 15.—The remarkable increase in building activity in Nashville is best shown by the fact that the volume of building represented by the building permits for the year up to this time is greater than the entire volume of building work for the whole of last year. Construction in April was above \$500,000 and was nearly a half-million dollars in May, while June is showing great progress in building lines.

All lines of building supplies are feeling the effects of this awakening and without exception dealers are moving their stocks rapidly. There is not an item of materials that is not being sold in more than normal quantities and this applies with special force to materials used in fireproof construction. It is interesting to note the number of apartment houses now being built in Nashville and advocates of good construction point out fire-protected building is the rule, rather than the exception, now in every class of structure except dwelling houses. Many apartment buildings, that formerly would have been built with wood partitions, now have hollow-tile and expanded metal interior walls, so that the joist-floors are the only inflammable portions of the building.

Among big work recently started may be mentioned the Hyde's Ferry bridge, in the piers and approaches of which a large quantity of concrete will be used. The contract for this was recently awarded, the figure being about \$230,000. The Fourth and First National bank, a six-story reinforced concrete building on a large area; the \$200,000 addition to the high school, St. Thomas hospital

and Buford College are among the buildings on which contracts have been awarded. The water-works department will also build a brick and concrete catch-basin shortly for the purpose of filtering the water during the cleaning of one of the settling basins.

Building material dealers and others who are interested in progress in construction in Nashville are delighted with the passage of the new building code, which has been previously described in ROCK PRODUCTS AND BUILDING MATERIALS. The measure was in preparation during a period of more than four months and the building department was assisted at sessions held practically every night by experts in every line. The work was also divided in among committees and each committee included, not only someone in the trade involved but also those outside of it, to insure attention to the public welfare as well as to particular trades. Prof. Charles S. Brown, dean of engineering of Vanderbilt University, was general chairman.

DWELLINGS AID PITTSBURGH'S BUSINESS.

Pittsburgh, Pa., June 10.—Some more house building is coming to the front this month, which is helping out the general situation considerably. Many corporations have found it necessary to build large numbers of houses for their employees. Suburban lot plans are also being opened up in many places around the city, and building is being started on these properties. It is significant that one or two allotment concerns, especially Wood-Harmon & Co., which have been out of the market for several years, are now beginning to operate on new properties. Dealers in different parts of the city are getting quite a lot of business from these activities. The total of building in Pittsburgh, however, is not up to expectations by any means.

Street and road work is going forward in somewhat larger amounts owing to the letting of many contracts this month. The continual rainy weather has hurt this business greatly, for there has been hardly a day in June when grading operations could be carried on to good advantage. Prices of building material are, for the most part, very high. Dealers are doing more business than last year, but most of them report that they could easily handle from fifty to 100 per cent more business with their present equipment.

CLIMATIC CONDITIONS AFFECT CROPS.

The deficiency in temperature and cold rains have had a telling effect on farming conditions of the country during the past few weeks. The fields are full of weeds and the ground is too wet to cultivate. Delayed farm work is reported in many sections of the country. The weather has been especially unfavorable for corn and cotton. In some of the corn sections of the country the crop has had to be replanted. To offset this, however, some sections, such as the West Central part of Illinois, report that all crops are in fine condition and that wheat is heading out nicely. A similar report comes from the southwest section of Michigan where wheat, rye, oats and hay seem to be in a fine condition.

BUTTE BUILDING TIED UP.

A general lockout by nearly all employers of labor in Butte, Mont., has completely tied up building and the material men are for the time being doing nothing. The union workmen had decided on listing certain work as "unfair;" and the employers' organization decided to forestall a strike by a general lockout. It is claimed that bankers, merchants and contractors are lined up with other employers of labor and that a finish fight is planned.

SAY WICCAPEE!

It Has Stood the
Test of Time

New York Rubber Co.

(INC. 1851)

N. Y. CITY, N. Y., CHICAGO, ILL.

FACTORIES:
BEACON, N. Y.

Wire Rope Economy

Operating expense does not depend upon the first cost of the equipment used, but it is the result of using equipment that will do the greatest amount of work in proportion to its cost.

"HERCULES"
(HARD STRAND)
WIRE ROPE

is economical because of its unusual durability. If you are not familiar with the results to be obtained from Hercules Wire Rope, why not give it a trial? Many others have done so, and are now using it to their profit.

Engineering Problems

Another important factor in Wire Rope economy is the correct selection of rope construction. We have a large Engineering Department which has made careful study of various working conditions, and we will gladly help you solve your engineering problems.

Established 1857

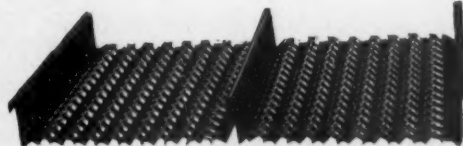
**A. Leschen & Sons
Rope Company**
ST. LOUIS, MO.

New York Chicago Denver
Salt Lake City San Francisco



Bigger Business, More Profits

The Complete Line of Best Products



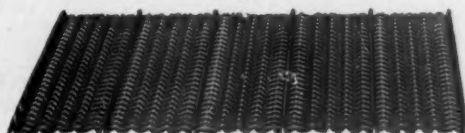
1 1/2-in. Hy-Rib. Very rigid. For heavy loads and wide spans.



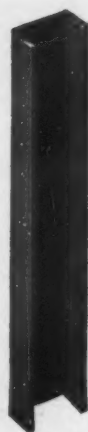
15/16-in. Hy-Rib for floors and roofs without forms—sidings, partitions and ceilings without channels.



13/16-in. Hy-Rib. Widely used in partitions, sidings and ceilings.



1/2-in. Hy-Rib Lath used as self-furring lath and in partitions, ceilings, etc., for stud spacings 24 in. to 36 in.



Channels without prongs, 1, 1 1/2, 2 inches.



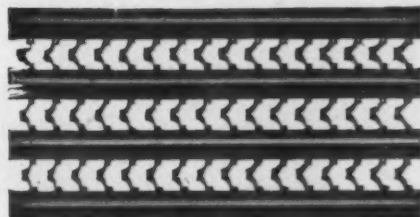
Trussed Concrete Steel Co.
Dept. H 26

Youngstown, O.

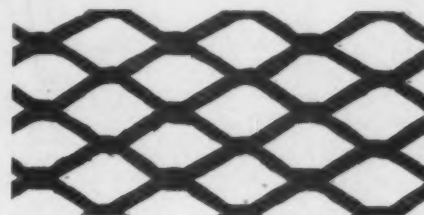
REPRESENTATIVES IN PRINCIPAL CITIES



Kahn pressed steel channel studs, 3, 4, 5, 6 inches; also 2 inches without turned flange



Beaded Plate Rib Lath permits two-coat work instead of three.



Diamond lath in two types and various gauges.

Tell 'em you saw it in ROCK PRODUCTS AND BUILDING MATERIALS



An Old Brand in a New Territory

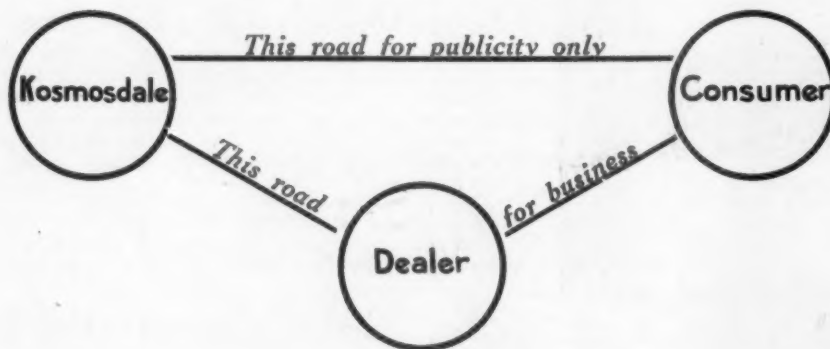
A recent decision of the Interstate Commerce Commission puts us in a position to meet competitive prices in Ohio, Indiana and Illinois, to which we have, geographically, one of the closest mills.

Kosmos Portland Cement has been used very largely south of the Ohio River for 12 years. A little has gone north; the Gibson House at Cincinnati (entirely of Kosmos—Wells Bros., contractors), the new Library at Indianapolis (half the order—George A. Fuller Co., contractors), and 18,000 barrels purchased by the State Highway Commission of Illinois, are northern testimonials to its quality.

An Advanced Selling System

We believe the proper way to sell cement is through the dealer; it is better for the consumer and better for us than if we did business direct. But we do not stop at a simple protective policy. We co-operate actively with the dealer by reaching directly every important consumer of cement in his locality.

The general Kosmos advertising is also liberal and effective.



Tell 'em you saw it in ROCK PRODUCTS AND BUILDING MATERIALS

Service in Advertising

"Of the thirty odd trade papers we are dealing with, we do not believe we ever had as good all-around service as we receive from your office."

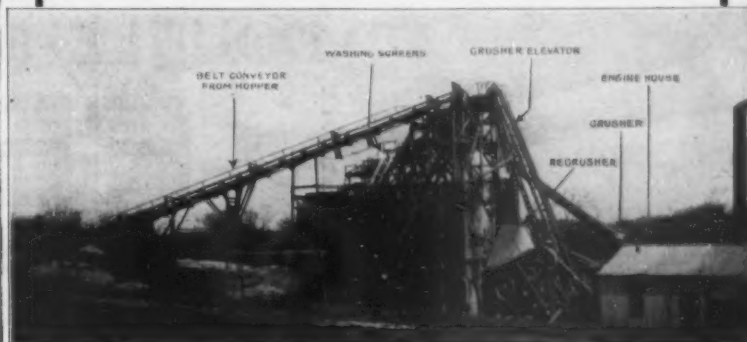
The above is an extract from a recent letter from one of our clients (name upon request).

Does this mean anything to you?

**Rock Products
& Building Materials**
"Nothing Succeeds Like Service"

The Economy of Correct Design

Talk to any of the three hundred odd operators of "S-A" Gravel Washing Plants (write for names of plants in your locality). See in what particulars the design of the plant has been made to take advantage of the peculiar conditions of your market, railroad facilities, "lay" of the land, etc. See the necessity of having your plant designed by engineers who have made a specialty of this class of work and whose years of experience coincide with the age of the industry.



We are at your service to consult on special details or to submit a layout for a complete plant. Write.

Stephens-Adamson Mfg. Company
AURORA, ILLINOIS

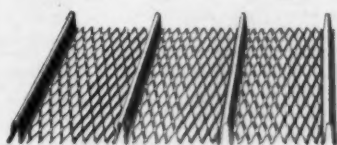
New York Chicago 40184 St. Louis Denver Detroit
Huntington, W. Va. Los Angeles Pittsburgh Salt Lake City Toronto, Ont.



Trade Mark

Reg. U. S. Pat. Off.

Self-Sentering



for roofs, floors, curtain walls, ceilings and partitions. Form and reinforcement in one, lath and stud combined. Reduces cost by eliminating form work.

GF Steel Tile



Steel forms for T-beam concrete floors. Save material, weight, time and expense. Used in any building, for any load, and spans to 30 feet.

High Grade Building Products High Power Dealer Service

The GF Line of Fireproof Building Materials and Waterproofings is known everywhere for uniform high quality and service.

This is an asset to the dealer—it makes selling easier—increases profits—builds up a permanent trade on the most substantial basis.

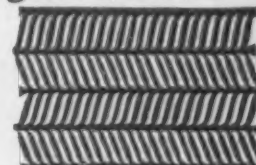
Write for details, your territory may be open and the GF Line will mean more business and profit to you.

The General Fireproofing Co.

1622 Logan Avenue

Youngstown, Ohio

Herringbone Rigid Metal Lath



—the stiffest metal lath made. Permits 16" to 20" stud spacing, economical to erect and plaster. A quality lath for all plastering, interior and exterior.



**GF Cold
Rolled
Channel**

For solid and hollow partitions, suspended ceilings, furring, etc. Wide range of sizes—2 styles.

Also Trussit, Corner Bead, Wall Ties, Furring, etc., and a full line of GF Waterproofings, Damp-proofings, Technical Paints and Concrete Hardeners.

Tell 'em you saw it in ROCK PRODUCTS AND BUILDING MATERIALS

THE PLIES CAN'T SEPARATE
 (THEY'RE DOUBLE STITCHED)
 THAT'S ONE REASON WHY
REXALL
 DOUBLE-STITCHED
BELTING

WILL BE FOUND IN
 THE LARGE UP-TO-DATE
 SAND & GRAVEL PLANTS

IMPERIAL BELTING COMPANY

SALES OFFICES
 42 BROADWAY, NEW YORK CITY
 325 WALKER BANK BLDG., SALT LAKE CITY

GEN'L OFFICES AND FACTORY
 LINCOLN AND KINZIE STREETS
 CHICAGO

THE IMPROVED EQUIPMENT CO.

COMBUSTION ENGINEERS

DESIGNERS AND BUILDERS OF
 COMPLETE GAS PLANTS GAS BENCHES
 LIME BURNING PLANTS GAS PRODUCERS
 SPECIAL INDUSTRIAL FURNACES

ROBERT W. HUNT JNO. J. CONE JAS. C. HALLSTED D. W. McNAUGHER

ROBERT W. HUNT & CO., ENGINEERS
INSPECTION CEMENT & REINFORCING STEEL
 CHEMICAL AND PHYSICAL TESTING

Chicago, Montreal New York San Francisco Office and Laboratories Pittsburgh Toronto St. Louis Mexico City London Seattle

CLINTON BRICK AND MORTAR COLORS

Our Label on Each Package Is the
 Guarantee, Used Successfully for 35 Years

CLINTON METALLIC PAINT CO., Dept. R, Clinton, N. Y.

The Fuller Engineering Co.

Designing, Constructing and Operating Engineers
Analytical Chemists

CEMENT AND HYDRATED LIME PLANTS A SPECIALTY

Offices: Allentown Natl. Bank Bldg., Allentown, Pa.

Mr. GRAVEL PRODUCER

If, by the use of one machine, you could eliminate a complicated system of digging, conveying and elevating from pit to plant, would you not be interested?

Then investigate the
 Shearer & Mayer

**Dragline Cableway
 Excavator**

A machine which digs, conveys and elevates in one continuous forward operation.



SAUERMAN BROS., 1140 Monadnock Blk., Chicago

F. L. SMIDTH & CO. 50 Church St. NEW YORK

SPECIALISTS IN

Engineering Cement Works

Cement Making Machinery

Lime Plants
 Stone Crushing Plants Sand and Gravel Plants

EARL C. HARSH
 Mechanical and Electrical Engineer
 Nicholas Building, Toledo, O.

Tell 'em you saw it in ROCK PRODUCTS AND BUILDING MATERIALS

GENERAL REVIEW OF BUILDING STATISTICS.

New York, June 18.—Price changes in the building material market in the first half of the month were few, but the trend was downward. This was led early in the week by two steel quotations that showed a reaction from the present high prices heretofore prevailing for this material. It was frankly stated that the change was in deference to eastern builders who have been inclined to hold back orders pending more moderate price levels.

Only one month of last year (April) showed a total above \$100,000,000, and the aggregate for May this year, \$107,831,031, dwarfs this with some twenty-three more cities yet to hear from. Additionally interesting to, is the fact that the numbers of permits show large gains over the like month of last year, and only two groups fail to show a larger number of permits, while every month reports larger values than a year ago. Following is a concise summary of the permits and values of the various sections of this country and in Canada for May this year and last:

	No. of cities.	Permits. 1916.	Values. 1916.	Permits. 1915.	Comp'd with last year. Val's. Inc'd.
New Eng.	18	1,817	\$ 7,107,182	24.8	28.0
Middle	27	6,392	39,458,466	1.5	18.5
Western	19	7,389	16,059,530	38.1	25.6
Northwest	16	4,100	28,891,034	22.7	92.6
Southwest	13	1,980	3,447,757	*2.3	25.5
Southern	22	3,128	6,869,504	*.7	37.4
Far-western	17	3,738	5,907,540	10.2	32.6
Total U. S.	132	28,544	\$107,831,013	14.1	36.6
Canada	11	1,791	3,131,956	4.1	*4.2

*Decrease.

There were 28,544 permits recorded at 132 cities in May, an increase of 14.1 per cent, while the value of the building permitted for \$107,831,031, shows a gain of 36.6 per cent. Compared with the largest month's building ever heretofore recorded (April, 1912), there is an increase of nearly five per cent. The percentage of increase in value over May a year ago is the heaviest recorded in any month this year, and eighty-seven out of the 132 cities (two-thirds of all) show gains in values as compared with the like month last year. An additionally interesting feature is that the addition of the large May total to previous months' returns puts this year well up in the scale of building expenditure, with the probability that 1916, which so far shows a gain over last year of 22.3 per cent, may surpass all previous records for the full calendar year.

CHATTANOOGA FORGING AHEAD.

Chattanooga, Tenn., June 15.—Several days prior to June 1, 60,000 yards of dirt had been moved at the site of the Chattanooga Steel Co., Chattanooga, Tenn., in the course of leveling a long, narrow strip of land for the mill. Sewers were being constructed, wells bored, and material unloaded from cars delivered at the site by means of a spur from the Signal Mountain line. The boulevard to Signal Mountain was being routed another way so as to go around the mill property.

There will be two seventy-five-ton open hearth furnaces producing a maximum of 336 tons per day. The blooming mill capacity will be 1,000 tons. The output will be marketed in a semi-finished state for the present but at the proper time the company will put into a finished state all the output.

The plant is north of the Tennessee River from Chattanooga on a 100-acre tract which will provide ample space for the initial buildings and future contemplated expansion. Railroad connection will be provided by Mr. James from the new factory district known as "Moccasin Bend" to the trunk lines at Hixon, Tenn. As the property lies along the Tennessee River, there will be facilities for receiving water shipments of raw material and also for shipping finished products in boats to western and southwestern markets.

The initial plant, in all departments, will employ about 600 men, a good portion of whom will be

expert rollers imported from other places. When the program is put in effect fully, the employees will number from 1,800 to 2,000. Land around the mill is well adapted to an industrial community and it is anticipated that many homes for workmen will spring up there.

The building will be of concrete and steel. The Converse Bridge & Steel Co., Chattanooga, will fabricate and erect the steel frame for the mill. The plant will represent the "last word" in construction. Electric power will be used throughout, bought from the Chattanooga & Tennessee River Power Co., operating the Hales Bar plant, built by the late Anthony N. Brady and associates including Mr. James. The power company has made an especially attractive rate.

It is stated that the completed plant (that is, when the finishing department is added) will be some 2,800 feet long and 200 feet wide.

Chattanooga and immediate vicinity will provide sufficient pig iron, scrap iron and steel to feed the steel mill. The Chattanooga Iron & Coal Corporation is now making at least 200 tons of pig iron daily, much of which moves by river to Ohio river points for Chicago and St. Louis. The mill will use about 65 per cent scrap iron and 35 per cent pig. While Mr. James has not expressed himself in this regard, it is predicted that the company will put up a modern blast furnace for the production of its own pig iron.

There is a strong feeling here, borne out by precedent and the logic of the situation, that the steel mill will be followed by other important allied industries. Among the first, of co-ordinate character, it is pointed out that another by-product coke oven plant and a tar treating plant suggest themselves.

While the steel mill overtops everything else under way or definitely projected it is one of many things contributing to the present prosperity and certainty of future rapid development of Chattanooga. Among the other items may be enumerated:

A \$500,000 twelve-story office building of the Volunteer State Life Insurance Co., frame of which is under way.

New buildings and equipment at Davis Hosiery Mill to double its capacity.

A \$400,000 Thatcher Spinning Mill, being built; reinforced concrete.

A \$200,000 plant of the Marion Extract Works, under way.

A \$200,000 plant being built by the Chattanooga Chemical Co.

A \$100,000 modern wharf and electric freight handling equipment; cash in bank; plans nearly ready.

New plant of Kalbfleisch Chemical Co., to make waterworks supplies; initial buildings and equipment to cost about \$100,000.

An \$800,000 concrete bridge over Tennessee river approaching completion.

Seven miles of railroad under construction, connecting new Moccasin Bend factory district with trunk railroads.

Belt line extension of the Central of Georgia railroad to Alton Park industrial section.

Three-mile extension of the N. C. & St. L. railroad to Alton Park connecting with the T. A. & G. railroad. N. C. & St. L. transfer by barge and tug to reach new industrial section north of Tennessee river; for use until projected bridge over river is built.

Modern new buildings being erected for the University of Chattanooga from part of the \$500,000 endowment fund.

Additions to Erlanger hospital.

New concern, Lipson-Ryan Mfg. Co., \$25,000 capital, to make gloves and leggings.

A \$110,000 addition to Signal Mountain Inn, increasing number of rooms to 150; golf links and artificial lake.

Department store will build six-story building and many others.

EASTERN TRADE CONDITIONS.

Newark, N. J., June 15.—During the last few weeks business seems to have settled down to a more conservative basis than at any time since the beginning of the war, according to Tompkins Brothers, wholesalers of masons' materials at Newark and New York City. Although prices of nearly all commodities have steadily advanced, the maximum seems now to have been reached in most cases. While it is not expected that the prices of building materials will decline in the near future, certain large operators say that they will postpone construction work until they can purchase materials at lower figures than those now prevailing. Here is an ideal opportunity to observe the workings of the law of supply and demand. If operators find that business conditions make it necessary to build immediately, they will have to purchase at the present high prices. If they can afford to hold off for lower figures, prices will have to drop to create a market. But it is not expected that labor conditions and other disturbing elements will permit of lower markets in the immediate future, and therefore the many large building projects, especially in the metropolitan district and industrial centers, will be forced to go ahead without waiting for a more favorable market.

Construction material prices, except in a few instances, have held steady during the past month. Structural steel, common brick, lumber and sewer pipe are the only important items that have changed appreciably.

Most manufacturers are still finding it difficult to obtain enough men to run their plants at full capacity, even though many of them have orders sufficient to keep their wheels turning day and night. And this is not all war business. While the munition factories are as busy as ever, business is becoming more diversified and more independent of European conditions.

Transportation difficulties are less serious and the freight embargoes are about all lifted. This favorable condition is evidenced by the dissolution last week of the Eastern Freight Accumulation Committee, which was organized several months ago to relieve the freight congestion.

Because of higher manufacturing costs, scarcity of labor, increased price of bags and other supplies, the trade has been expecting, for two or three months past, a further advance in the price of Portland cement. It would now seem that the manufacturers were inclined to be very conservative as to this matter; evidently preferring larger business to large profit, with the usual curtailment of demand. Great quantities of cement are going into reinforced concrete construction; the cement taking the place of other materials that are higher in price and harder to obtain. In spite of the apparent attempt to hold cement down to its present figure, it would not be surprising if an advance should be announced a little later on.

The sewer pipe manufacturers recently revised their price list, with the intention of putting the new schedule into effect on June 15. Owing to some minor details, however, there will be some slight changes in the new list before it finally becomes effective.

The brick manufacturers are still having their troubles, and the strikes at the yards continue. The plants are now all operating, but hardly any of them are working to full capacity, on account of their inability to obtain laborers. Wages are much higher than last year, but labor is so scarce in the brick yard districts that the manufacturers have had to shut down part of their machines and use the operators to help load barges. The demand is fairly good and the market is firm, with North River brick selling at \$7.50 to \$7.75 wholesale, at docks, New York. Raritan are quoted at \$7.75. So long as the scarcity of labor continues to curtail the supply, prices will probably hold around these figures.

STRIKE AND RAIN RETARD BUILDING.

Boston, Mass., June 18.—A strike of 6,000 building laborers of Boston and ten days' straight rain has made the building trade of Boston unusually dull for the first half of June. The strike is in its third week and is crippling many of the building operations in Greater Boston. Mayor Curley hopes to bring about a settlement this week at a conference arranged between committees representing the building laborers and the building contractors and masons. A week ago several individual contractors signed the new scale.

Supply dealers are keen and alert now to land some of the juicy pickings which are almost within reach. The Boston Transit Commission recently awarded the contract for 4,000 barrels of Alpha Portland cement to one dealer, which is for use on the Dorchester subway which is expected will be completed this year.

Traffic congestion has been entirely relieved and embargoes are a thing of the past. The railroads solved the difficulty by imposing a demurrage charge of \$5 a day instead of \$1. The officials now declare that the yards and trackage are clear and car supply plentiful. Inbound freight is much lighter than it has been in some time. Several new warehouses are in contemplation since the railroads have practically put a stop to using the cars for warehouse purposes in carrying long lines of stock against future demands.

MECHANICAL REHANDLING.

The rehandling of crushed rock, screenings, sand, gravel, slag, cinders, and similar cheap, but indispensable commodities used in connection with building operations, has always been one of the most troublesome features of the business of the dealers in builders' supplies. Up to very recently a large number of the dealers positively refused to take on the expense, trouble and responsibility involved in handling so much tonnage with such a small margin of profit in comparison with the expense. "Too much sugar for a cent," was the common comparison used by the dealers who had already tried this matter out in the days of hand loading or shoveling from piles to the dealers' ordinary delivery wagon.

If there is any one place in the world where all the frailties of human nature seem to get concentrated, it is in connection with a shoveling proposition. Many an engineer and contractor have figured from early youth until they became bald-headed to find some kind of an average by which to gauge the expectations, and thereby measure the cost in advance, of a shoveling proposition. Hence, it is no wonder that the busy dealer man found it to be an insurmountable problem in connection with modern business. Yet the customer always wants to buy these materials from the dealer whenever he can, because nobody has any use for cement, lime or plaster unless he can get sand, and concrete is an impossibility without crushed rock or some substitute aggregate. Thus, the dealer in builders' supplies is always called upon and expected to be the local merchant for these materials. As a matter of fact whenever a supply house does carry a line of these materials it is to be noted that their business promptly grows to a very marked and gratifying extent.

The introduction of the motor truck for deliveries has simplified this feature of the business, and by intelligent application of the motor truck it becomes a very profitable branch of the operations, and a feeder for the sale of all the staple commodities such as cement, lime and plaster, as well as the specialties such as metal lath, corner beads, and reinforcing materials. The effectiveness of the motor truck has been worked out in two ways, the light truck carrying about a ton of material and making a large number of quick trips by running fast when

returning to the yard, or using big trucks with five trade who have long paid the price for shoveling without ever being able to find out the price until after the operation was completed. The combination of the motor truck and mechanical loader, when to seven ton capacity and thus moving an appreciable quantity of the material at one time so as to make the operation worth while.

When equipped according to either one of these two ideas it was found that that same old difficulty of the uncertainty of a hand shoveling operation held down the efficiency of the motor trucks so that there was little or no advantage even by their use. This suggested the necessity of a mechanical loader to sidestep the hand shoveling proposition, and to promptly and efficiently load the trucks with the minimum of delay so as to allow the actual efficiency of the transportation outfit to become available.

Several concerns got busy to supply the mechanical loader needs of the trade, notable amongst which are the machines of the George Haiss Manufacturing Co., of New York, the John F. Byers Machine Co., of Ravenna, Ohio, and the Jeffrey Manufacturing Co., of Columbus, O., besides the locomotive cranes, and derricks with grab-bucket equipments that have been provided for the larger installations.

The mechanical unloaders and loaders should really be named, "rehandling machines," for that is the function which they perform as known to the



JEFFREY LOADER IN McQUADE & BANNIGAN'S YARD, UTICA, N. Y.

working in conjunction with an elevated spur track, makes an ideal equipment for the dealer to make the best profits out of the cheap, loose, raw materials, which he has to find a way to handle economically if he ever expects to make the most out of the supply business.

McQuade & Bannigan, Utica, N. Y., were one of the first dealers to catch the stride of rehandling sand and crushed rock in this way. They put in their motor trucks first, two of them, and found that the standing time was eating up the efficiency of the machines. Early in the spring of 1915, they installed a Jeffrey self propelled loader, which operates with a gasoline engine; this made all of their difficulties vanish very rapidly. The same thing can be said of a number of other yards that have been equipped with similar labor saving equipment.

In speaking of their rehandling and transportation outfit McQuade & Bannigan say: "We have been using our truck loader for more than a year. The reason we installed it was that we have two three-ton power dump motor trucks and when we were compelled to load them by hand, it proved to be a very expensive arrangement because the trucks were delayed so long. Now, we can put a load on in from three to four minutes. There is no question but what the loaders are a great factor in economizing the labor. Three men have loaded out over 200 tons of crushed rock in a day from our yard, using the loader."

CALIFORNIA'S COMPENSATION LAW.

The decision of the California Supreme Court virtually nullifying a part of the California Workman's Compensation law, by holding that the owner is not responsible for injury to a contractor's employee, by working an injury on a large number of contractors, has attracted a lot of attention from material men and other creditors of these contractors. It is claimed that by throwing all the accident liability on contractors many of the latter are so financially weak that a serious accident to a number of employees might throw them into bankruptcy. It is believed that the Industrial Accident Commission will endeavor to remedy the trouble at the next session of the legislature by having a law passed compelling all contractors to take out insurance for their employees. Last week the San Francisco Building Trades Council placed a labor embargo on all contractors and owners who do not carry liability insurance for all workmen affiliated with the building trades.

CONDITIONS IN WESTERN CANADA.

Winnipeg, Man., June 17.—Business in the builders' supply business in Western Canada continues to pick up. The farmers are through with their seeding operations, which have been carried on in perfect seeding weather, and another bumper crop is anticipated. Much country building is being done which has stimulated the retail trade at country points. Considerable farm trade is causing a good demand for all kinds of building materials, many concrete barns and other farm buildings being under construction throughout the prairie provinces at the present time. Prices are about the same as in 1913, being a little higher than those of 1914 and 1915.

The builders' supply dealers at Saskatoon report business thriving. Here again it is the country trade which has given business an impetus. Trade in the cities, however, is very quiet, owing, no doubt, to the exodus resulting from the large number of men having enlisted. There are too many residences and apartment blocks vacant this year to make any trade in this line. There are, however, several business blocks being erected in the larger cities. At Vancouver, B. C., work is to start on a \$200,000 theatre, the architect on which is Robertson, Godson Co., Ltd., Seattle, Wash.

At Winnipeg work has just been started on a million bushel reinforced concrete elevator costing \$500,000.

An interesting announcement is that the big plant of the Sidney Island Brick & Tile Co., Vancouver, B. C., which has been idle for more than a year, is resuming operations because of better conditions in the building trades. The plant turns out 40,000 bricks a day and has orders for brick and tile to keep it busy for several months.

The building permits for Winnipeg for 1916 already total more than \$1,000,000, being nearly twice what they were during a corresponding period of last year. Last month the new buildings were valued at \$395,700 as compared with \$135,000 for 1915.

CAR SHORTAGE GREATLY REDUCED.

Statistical statement No. 17 of the American Railway Association, published on June 10, shows a shortage of only 12,344 cars on June 1, as against 29,983 on May 1. Although the situation is not down to normal, there exists very little shortage of any class of equipment in any one section. On June 1, 1915, there was a shortage of only 218 cars.

The total surplus of cars on June 1 was strengthened by the addition of 4,144 cars over May 1. On June 1 there was a surplus of 67,588 cars, while on June 1, 1915, the figures totaled 300,146 cars.

CONCRETE

SPECIAL COURSE FOR INSTRUCTORS.

The extension division of the Portland Cement Association, under A. J. R. Curtis, director of the division, has arranged a short course on concrete so that manual training and vocational teachers, wherever they may be located, will have an opportunity to come to Chicago and be efficiently instructed in the fundamentals required for the successful teaching of the use of cement and the practical applications of concrete. The course will be held at the Lewis Institute in Chicago, June 26 to July 1. The course will include lectures, demonstrations, classroom and laboratory work. It will be given by engineers and teachers of national reputation in the cement industry assisted by a force of laboratory experts and artists. A general outline of the topics to be presented for discussion consists of:

1. Materials for Concrete, Tests, Methods of Selection, Proportioning.
2. Mixing and Depositing Concrete.
3. Tools and Equipment for Manual Training Concrete Work.
4. Forms for Simple Exercises.
5. Surface Treatments.
6. Methods of Curing Concrete Products.
7. Watertight Concrete: Methods of Repairing Leaky Cisterns and Tanks.
8. Fundamental Principles of Reinforcing.
9. Concrete Highway Construction.
10. Practical Problems for Concrete Classes.

Enrollment is open to supervisors and instructors in manual training work without charge. The accommodations are necessarily limited, owing to the large amount of space and equipment required for the rather extensive demonstration work, and preference will be given applications according to the order in which they are received. There will be no expense whatever



MEMBERS OF GREATER WINNIPEG BOARD INSIDE CONCRETE AQUEDUCT.

connected with the course except for meals and lodging, for which arrangements have been made at very moderate rates.

The whole course is designed to be intensely practical and affords a long needed opportunity for instructors to study the theory of making concrete and become acquainted with the best recognized practice. The tremendous importance and ever growing need for greater intelligence in the use of concrete has long been recognized as one of the greatest needs of modern vocational education.

Preparations have been made for a very large attendance and the entertainment features in connection with the course of study are such as will make the whole undertaking a very attractive one to those who participate in it.

Officials Examine Winnipeg's Aqueduct.

Winnipeg, Man., June 17.—A party numbering twenty, consisting of members of the Winnipeg City Council and officials of the Winnipeg Greater Water District, made their first official inspection of the concrete aqueduct which is part of a \$13,500,000 water scheme for the city of Winnipeg and surrounding municipalities.

The first stop was made near Deacon, where sections of the aqueduct under construction by Thos. Kelly & Sons were visible, but could not be entered owing to the condition consequent upon recent bad weather. Proceeding, the party entered the No. 1 gravel pit where a new drag-line excavator was seen lifting two cubic yards of gravel and sand at a time from the pits into the trucks in which it is conveyed to the very efficient plant in which it is screened, sorted and finally mixed and loaded into trucks in the exact proportions required for use in making concrete of the best quality. As the result of various experiments carried out by Chief Engineer W. G. Chace and his assistants in the proportions in which the elements should be combined to make concrete possessing the greatest strength and density, the contractors are supplied from these gravel pits and plant with a mixture of sand and gravel producing concrete of uniform quality throughout the work.

The Cracks.

Further on the party was served with luncheon, after which an inspection of the finished interior of the aqueduct was made. Entrance was obtained through a manhole to the 5 ft. 4 in. inside diameter concrete tunnel at a point where some of the worst cracks have been reported. To the uninitiated eye there was no sign of fault in the surface and minute inspection is required to detect the bulk of the defects in the concrete, though here and there the cracks are much more clearly evident.

The journey was now continued to where the huge new drag-line excavator of the Winnipeg Aqueduct Construction Company was engaged in digging out muskeg at the rate of three and one-half cubic yards to each elevation of the massive bucket, dumping the excavated material nearly 100 feet away from the big ditch.

Reaching Shoal Lake about 4 p. m., the spot at which the soft pure water will commence its ninety-five mile journey to Winnipeg's reservoirs was visited.

Concrete pouring has already commenced and good progress is being made on the 1916 schedule.

Interesting Features.

The big concrete syphon takes the water be-



CONCRETE SYPHON UNDER WHITEMOUTH RIVER.

neath the bed of the Whitemouth River. Descending the inspection chamber on the east bank of the stream, two miles of completed aqueduct stretched from the point of observation, eastward, ending in a tiny spot of light, the impression gained is very much like that produced by looking through a telescope from the wide side to the narrow.

At another point was seen the drainage conduit, by which water from swamps south of the aqueduct will be carried off beneath it, the aqueduct itself resting on the crown of the culvert, or syphon through which it will pass.

Perhaps the most interesting incident of the trip occurred on reaching mile twenty-one, where the completed portion of the aqueduct in which the worst cracks have been observed was entered. From one manhole to another a distance of some 500 or 600 yards, the members of the Water Board walked along the side of the structure. Along the crown and along the invert at the bottom of the aqueduct the cracks extended longitudinally throughout most of the distance. The top cracks were practically all little more than hair lines; those below were at the most 11-40 of an inch wide, though predominantly narrower. That they did not extend to the under surface of the concrete bed was evidenced by the fact that water had lain in the aqueduct for some time and had not cleared away. The members of the Greater Winnipeg Water District expressed themselves as re-assured as to the stability of the structure.

The scheme was explained and illustrated in detail in our February 7th number in 1915.

The city of Atlanta, Ga., has had its first experience with concrete street building and it is believed that this is the forerunner of a large volume of construction of this kind. The first street was laid by the city under the direction of Karl Brittain, assistant chief of construction, who states that he is in favor of its use in the residential sections. The cost of laying was only one dollar per square yard, which he considers cheap for this class of work.

Hotels of Reinforced Concrete.

Hotel construction is one of the most popular applications of reinforced concrete. It is to be noted that the first prominent and universally attractive hotel building was the concrete hotel at St. Augustine, Fla., designed by Carrere & Hastings, architects of New York, about twenty years ago. That seems to have been the start of a new era in hotel construction which has spread all over the country to all of the great cities and even the smaller cities down to those having no more than 50,000 inhabitants. The experienced traveler of the present day, or the auto tourist is accustomed to ask for the new hotel. There is nearly always a new hotel, no matter where one happens to be, and in the great cities like New York, Philadelphia and Chicago every traveler is pretty sure to stop in a hotel that has been built in the new era of hotel building within the past twenty years.

What with the Biltmore and the McAlpine in New York, the Bellevue-Stratford and the Adelphia in Philadelphia, the Blackstone and the Sherman House in Chicago, and the impossible list, on account of its length, of hotels that have been built in other places, we have palatial magnificence everywhere in this humble republic that outclasses that of Louis IV in his palace at Versailles, the artistic glory of the Florentine palaces of Lorenzo de Medici or the barbaric grandeur of the palace of the Doges in Venice, thus reaching back to that time of medieval splendors when the labors and industries of whole nations contributed the wealth of their toil and effort to the aggrandizement of a single man.

In all of these hotel structures Portland cement and concrete derived by the use of the same has been one of the most important factors of their construction. In fact, none of them would have been possible or could be financed in these intelligent times were it not for the well-known fireproof value of concrete construction. So profusely has concrete been used in the construction of modern hotels that it can properly be said that currently hotels are of reinforced concrete construction throughout.

Atlantic City, the popular and convenient watering resort of the Eastern seaboard, has become the center for magnificently constructed and sumptuously furnished hotels. Here, as in other places, reinforced concrete has come to be the principal basic material upon which all of the lavish investment is founded and permanently depends.

A number of years ago the Marlborough-Blenheim was built, a particularly unique pile of reinforced concrete from foundation to dome. More recently has been constructed the Hotel Traymore, only reaching completion last spring, which is one of the grandest achievements in reinforced concrete construction. This hotel can well claim to be the largest resort hotel in this country, if not in the world. It is a fireproof structure of concrete and steel, faced externally with buff brick, with very elaborate and dignified trimmings. It covers a site 100 by 400 feet in plan and is seventeen stories high. The highest point of the main dome is 216 feet above the natural level of the sand. The foundations extend many feet down to a solid footing. This building has accommodations for 1400 people and has a very extensive public space, the main lobby being 250 ft. long.

The new Hotel Traymore was built by the contracting firm of Cramp & Co., of Philadelphia, after lines drawn by Price & McLanahan, Philadelphia architects. Edison Portland cement was used in all of the concrete work in connection with the construction of this great building. The equipment and furnishings are the best and most artistic obtainable. There are American and European plan dining rooms with accommodations for 800 and 400 people respectively, and in addition cafes, banquet rooms and private dining rooms. The building, which has been under construction for more than a



HOTEL TRAYMORE FROM THE SEA, ATLANTIC CITY, N. J.

year, was partially occupied last summer, for the different wings were put into use as fast as completed. The New Hotel Traymore is a triumph of reinforced concrete construction and a striking architectural addition of artistic value to the group of hotels at Atlantic City.

Announcement has been made by a syndicate composed of Philadelphia and New York financiers that another hotel is soon to be built at Atlantic City of reinforced concrete, which is to be larger and in every respect as grand as the Hotel Traymore. The new venture is to occupy the site of the present Hotel Rudolph.

CEMENT STUCCO CHURCH.

The use of cement plaster and rough cast for the exterior treatment of buildings is the best modern way to secure fine appearance at very low cost, and at the same time have a very substantial job which is completely weatherproof and really fire resisting as far as the exterior is concerned. Such construction was used in building the Calvary Evangelical church at Rochester, N. Y., by which a very attractive building, as shown in our illustration, at a minimum cost was secured for the owners. The design and specifications of this church were drawn by C. Storrs Barrows, and Young Bros., were the contractors, both of Rochester. A wooden frame was used and Kno-Fur metal lath was applied to the studs, and the plaster was spread directly upon the metal lath, which required no furring and for this reason is very economical both in labor and in material.

In cases where a wood frame is used and both sides of the wall are covered with cement plaster the building will be of a very high fire-resisting



CALVARY EVANGELICAL CHURCH, ROCHESTER, N. Y.

type, as has been demonstrated by numerous tests conducted by the most dependable scientists working with approved apparatus.

Chattanooga's Greatest Office Building.

Chattanooga, Tenn., June 15.—This city is enjoying a steady, healthy growth, as evidenced by building improvements exceeding all previous records. The largest modern office building is now being erected by the Volunteer State Life Insurance Co. It will provide the home of the insurance offices as well as a large revenue from renters of office space to other parties.

The building will be twelve stories high and one full story underground. The Georgia avenue frontage is 137½', the Ninth and Dewey street frontages are each 94½', giving a total street frontage of over 326 feet, or more than fifty per cent greater than any commercial building in Chattanooga. The location is the geographical center of the city, and one of the highest points in the business district.

The foundation was carried down to solid bed rock with reinforced concrete caissons.

Construction is the most modern kind, being a reinforced concrete skeleton with curtain walls of brick and hollow tile. Floors to be concrete and tile, the well-known system of fireproofing that has proved by experience and tests the best ever devised.

The main entrance will be in the center of the Georgia avenue front, auxiliary entrances will be through the various stores on Georgia avenue, Ninth and Dewey streets, giving the best possible circulation on the first floor. The walls and elevator fronts of first floor lobby will be built of white Georgia or Alabama marble. The floors will be light gray Tennessee marble with green Georgia marble border and base. All doors in main lobby will be mahogany or bronze.

The office space has been laid out and designed to obtain the maximum of natural light with flexibility and elasticity of space as the very next consideration. Therefore, any tenant can have a choice of from 140 square feet to as high as 8500 square feet of office space on one level, divided to suit his particular requirements.

The court offices are such in name only, as the great court will be fifty feet wide, faced with white vitreous brick; in other words, these offices will front on a court that is as wide as the average street. The architecture will be in the style of the Italian Renaissance. The pedestals on the sidewalks will be of polished gray North Carolina granite. The first, second and third stories will be veneered with Georgia or Tennessee marble.

MEDUSA WHITE IN INDIA.

Duncan Bros.' office building is an imposing structure in the heart of the city of Calcutta, India, commanding a full view of Clive street, which as tourists know is Calcutta's most bustling business thoroughfare.

The exterior of the building is faced with a mixture of 1 part Medusa White Portland Cement to 3 parts local white quartz sand, the cement having been supplied by William Jacks & Co., 1 Lall Bazar, Calcutta, sole agents for India.

The sand is not as white as the American quartz, but the result is a very pleasing color and resembles the white Porebinder stone which is imported from the Bombay Presidency for many Calcutta buildings.

The plinth, for a height of about five feet, is a dark grey, and is faced with mosaic consisting of grey Portland cement and white marble chips, and polished to represent Scotch granite.

The building was erected for Duncan Bros. of Glasgow, London and Calcutta, by Mackintosh Burn Ltd., builders and contractors, to designs by Vincent J. Esche, L. R. I. B. A., the well known Calcutta architect.



DUNCAN BROS.' OFFICE BUILDING, CALCUTTA, INDIA.

STUDY CONCRETE FOR ROADS.

Miles Bulger, presiding judge of the Jackson county court, and E. M. Stayton, county highway engineer, Kansas City, Mo., left the middle of June for Detroit to study the Wayne county roads. The Kansas City Star in commenting on the trip said the following: "Detroit's experience with concrete highways has been remarkable. Ten years have elapsed since the first roads of that material were built, and no appreciable depreciation is evident today. The cost of up-keep is said to be negligible. The County court contemplates experimenting with concrete in Jackson county."

WINNIPEG'S \$6,000,000 BUILDING.

Winnipeg, Man., May 1.—Work is proceeding rapidly on the new \$6,000,000 building which Carter-Halls-Aldinger, Ltd., are erecting for the T. Eaton Co., at Winnipeg.

The new building will occupy two blocks, will be twelve stories in height or 215 feet, and one portion will take the place of the present eight-story building which fronts on the main street of Winnipeg. Bridges will connect these portions and will be thirty-eight feet from the ground and nine stories high. Sundry tunnels will also connect the buildings. The new building will be constructed of reinforced concrete, the outside finish being of Tyndall stone from the ground to the top of the second story; the remaining stories will be of buff-face brick. The work will be done in units, and the entire scheme will take about ten years to complete, the idea being to construct a \$600,000 unit each year. During 1916 the warehouse will be

erected which will be twelve stories high. This is being pushed ahead at the present time. Twenty-seven concrete caissons have been sunk to provide for the huge building. Fifty-two feet has been the average depth to bedrock, though three caissons went down sixty-four feet.

PROPERTIES OF CONCRETES.

The Bureau of Standards, Department of Commerce, has just issued Technologic Paper No. 58, dealing with the properties of concrete and Portland cement mortars, under the title "Strength and Other Properties of Concretes as Affected by Materials and Methods of Preparation." It includes the results of about 20,000 tests on about 300 aggregates consisting of limestone, granite, gravel and trap rock which are used for concrete materials in various sections of the United States.

The results are of especial interest to contractors, engineers, architects and others who use concrete, since it points out that with the same aggregates a variation in strength of as much as 100 per cent may result owing to the lack of proper precautions in mixing and placing the material. The effect on the compressive strength of each of the factors, such as, type of aggregate, method of mixing, method of molding, the consistency, the density, the method of storing or curing conditions, abnormal methods of curing, characteristics of the aggregate, proportions of cement to aggregate, age, etc., are studied separately and the results are shown in tables and diagrams. One of the most important conclusions to be derived from the results is that the use of too great an amount of mixing water, which is common in present day con-

struction, accounts for many concrete failures. The use of an excessive amount of mixing water may result in a reduction in strength as great as would result from a reduction of 50% in the amount of cement used. The results indicate that proper methods of mixing and fabrication are as important as good cement and aggregate in producing a concrete of the best quality.

CHATHAM BRIDGE CONTRACT LET.

The Foster Construction Co., Newark, N. J., has been awarded the contract by a joint committee of the freeholders of Morris and Union counties, New Jersey, for a concrete bridge to be erected over the Passaic River at Chatham, N. J. The bridge has a clear span of seventy-five feet, and the contract price is \$12,880. Work will immediately proceed with a view to having the bridge in commission before snow flies.

PITTSBURGH BUILDERS DEFER ACTION.

Pittsburgh, Pa., June 20.—Concrete work is not going ahead as engineers and dealers would like to see it. The reason seems to be that bids are altogether too high. Labor and materials are both running very much higher in price than most builders like to see and many big jobs are being held up on this account. Pittsburgh confidently expected to see this year the building of two more skyscrapers, one by the Mellon interests and the other by the Union Trust Co. Both projects are held up until prices break. It is reported also that considerable corporation and railroad work is being held up for the same reason. Comparatively little good work is now being figured by the local engineers. Much of this is warehouse building.

CONCRETE SHEDS FOR RAILROAD.

San Francisco, Cal.—The Southern Pacific Railroad Co., which has many miles of wooden snow sheds built over its road bed in the Sierra Nevada mountains and which has suffered severely from the burning of these, has had concrete contractors up in the mountains looking over the situation with a view to replacing portions of these sheds at intervals with concrete sheds to act as fire breaks.

The Pekin Concrete Products Co., Pekin, Ill.; capital, \$15,000; incorporators, J. Leonard Taylor, George P. Kroll and Adam Saal.



ARCHITECT'S PERSPECTIVE OF REINFORCED CONCRETE, T. EATON BUILDING AT WINNIPEG, TO BE TWELVE STORIES HIGH AND TO COST \$6,000,000.

CEMENT

GOOD BUSINESS.

Strong demand for Portland cement is the prevailing condition in all of the principal markets. In New York with increasing activity of building work there is no change in quotations. In the Central West the mill price averages \$1.25 per barrel, and that means all other markets ruling proportionately.

TO PASS ON CEMENT SPECIFICATIONS.

The nineteenth annual meeting of the American Society for Testing Materials will be held at Atlantic City, N. J., June 27 to 30. Headquarters at the Traymore Hotel. A revision of the requirements for Portland cement in the present standard specifications is to be passed upon at this meeting. Standard tests for wood materials and many other technical matters relating to the control and improvement of the materials of constructing will be considered.

A NEW MONTANA MILL.

Great Falls, Mont., June 13.—A cement plant with a capacity of 500 barrels will be erected at Great Falls in the immediate future, according to C. A. Lindsay of Monarch, who operates a plaster mill there.

Mr. Lindsay says the land with the necessary cement rock has been secured and a manufacturing site selected at Great Falls.

TWO YEARS TO MAKE A TURNOVER.

W. S. Mallory, president of the Edison Portland Cement Co., when in Chicago recently stated that the cement business from the standpoint of the manufacturer, is in reality a slow-going business on account of the length of time necessary to turn the capital. He recently favored us with a copy of an official tabulation giving a number of comparisons and exhibiting the time required in various industries to turn the capital. The table and illustration is published herewith:

The figures in this tabulation are taken from the annual report of the Commissioner of Labor and Industry of the State of Pennsylvania, issued on December 1, 1915, manufacturing industries in Pennsylvania whose annual sales are \$20,000,000, or more. Capital invested covers both plant and working capital.

	Number establish- ments re- porting	Average days in operation	Capital Invested	Market value of product	Months necessary to turn capital
Tin plate.....	9	250	\$ 6,500,000	\$ 86,800,000	1
Fertilizer.....	33	300	4,400,000	28,900,000	2
Meat packing.....	60	298	9,900,000	55,300,000	2
Boots and shoes.....	129	283	12,100,000	44,200,000	3
Hoops, bands and cotton tie products.....	4	318	5,700,000	23,300,000	3
Flour and grist mill products.....	372	290	10,300,000	29,900,000	4
Sugar refining.....	5	289	15,900,000	44,800,000	4
Bakery products.....	1,820	309	16,700,000	43,100,000	5
Billets and slabs—Steel.....	13	301	93,400,000	218,800,000	5
Cigars.....	927	268	23,900,000	58,800,000	5
Pig iron.....	32	268	45,800,000	110,700,000	5
Silks.....	255	279	39,000,000	86,600,000	5
Clothing, men's.....	191	290	11,400,000	21,400,000	6
Hosiery and knit goods.....	311	295	23,400,000	46,500,000	6
Structural shapes.....	27	289	23,400,000	46,800,000	6
Woolen and worsted goods.....	86	283	15,200,000	29,700,000	6
Leather.....	81	284	69,400,000	92,300,000	8
Paints and varnishes.....	106	281	17,000,000	24,500,000	8
Planing mill products.....	439	284	19,500,000	28,400,000	8
Yarns.....	104	260	25,800,000	36,900,000	8
Wire products.....	64	276	27,100,000	36,800,000	9
Castings—Iron.....	191	276	19,600,000	23,000,000	10
Paper goods.....	59	290	21,200,000	24,100,000	11
Printing and publishing.....	1,628	300	72,400,000	76,000,000	11
Petroleum—Refined.....	61	327	39,800,000	38,100,000	12
Carpets and rugs.....	79	276	27,400,000	25,600,000	13
Cars.....	17	294	51,800,000	44,700,000	14
Chemicals.....	69	282	23,900,000	20,800,000	14
Machinery.....	374	289	82,200,000	69,200,000	14
Pipes and tubing—Rolled.....	35	272	45,600,000	36,600,000	16
Liquors—Malt.....	209	308	92,200,000	47,000,000	23
Cement.....	32	279	47,100,000	23,900,000	24
Coke*.....	53	240	145,900,000	28,400,000	60

* The coke industry has a large amount of capital invested in coal lands.

It will be noted that the cement industry in Pennsylvania requires two years to make a complete turn over of its capital, which is a longer length of time than that of any other industry listed, with the single exception of coke. While the figures given apply only to the industries located in the state of Pennsylvania, they are, very probably, a fair index of conditions that exist in most of the other large manufacturing states, with regard to the industries listed.

The production of Portland cement in the state of Pennsylvania is greater than that of any other state, about one-third of all of the cement produced in the United States being made in the two districts, one at the east end and the other in the western part of the state.

NEW YORK MARKET STRONG.

New York, June 18.—New conditions govern quotations on Portland cement in the New York market. There is also developing a strong sentiment on the part of certain manufacturers against further advances in price.

Hereafter, when a quotation is made to a contractor who has a contract, or to a dealer who is quoting to a contractor, the quotation given will be good only for a five-day acceptance. When quotations in either case are made when contractors are bidding on jobs the quotation limit will be only fifteen days instead of thirty days as formerly.

This action gave rise to the report among dealers that prices had advanced from \$1.67 to \$1.72. This, however, was not the case. The general manager of a great cement company gave this statement to ROCK PRODUCTS AND BUILDING MATERIALS.

"The peak in the price movement of all building materials has been reached. Further price inflation at this time, on the eve of one of the most intense political campaigns this country has ever known when finances may be more or less disturbed is wrong. It seems to me to be the part of wisdom to encourage all that work that has been held up instead of holding prices up. May plan filings for the country showed a gain, although that for contracts awarded showed a decrease of almost \$2,900,-

000. In New York the plan filings for May showed a gain of \$2,000,000, but a falling off in contracts awarded amounting to almost \$4,000,000.

"This shows that owners and building projectors are prepared to build, but they are not prepared to pay exorbitant prices for materials. The demand for new buildings and the uncertainties regarding the industrial future of this country combine to prompt them to hold up jobs. They are not prepared to pay crazy prices. It is time that the building material interests looked at the future of the eastern market in a sensible way and plan to help the present wave of quasi prosperity to continue rather than to seek to choke it off."

NEW MILL OPERATING.

The Oregon Portland Cement Co.'s plant at Oswego, Ore., was started into operation June 1, with a capacity of 1,000 barrels per day. This plant has been under construction for several years and is built almost entirely of reinforced concrete as far as the structures are concerned.

REMODELING HUMBOLT MILL.

T. J. Klossowski, of Dixon, Ill., cement mill engineer, is now in Humboldt, Kan., remodeling the Monarch Cement Co.'s plant. He is putting in a completely new installation for handling the clinker, a new raw and finished grinding department, including hammer mills of the largest size, tube mills, a modern stacking department and other improvements. This work is now approaching completion and will enable the plant to be operated by using coal, oil or gas for fuel, whichever proves to be the most economical at the time.

CEMENT PLANT ADDITION.

Fenton, Mich., June 16.—A new addition to the Aetna Portland Cement plant is under construction by the Slater company, of Detroit. It consists of a large new kiln room 50 by 225 feet. Two new kilns will be installed which will increase the output of the plant about 400 barrels more of cement each day. This will make the daily output about 1,800 barrels a day. The building will be completed by August 1.

DEMOPOLIS CEMENT PLANT.

Demopolis, Ala., June 7.—Major Henry W. Hayden and A. R. Smith have returned from Birmingham, where they were invited to attend a luncheon given by Judge B. M. Allen, at which were present about a dozen capitalists, besides the Demopolis representatives. In the informal discussion over the proposed Spocari cement plant it developed that the parties interested had already had a man, one of the most expert cement chemists in the South, look over the plant.

He reported that running the plant along the plans proposed would easily insure an output of 750 barrels of cement per day of as good a quality as could be manufactured.

PLANS TO REBUILD.

Alabama Portland Cement & Lime Co., Spocari, Ala., T. M. Wingo, secretary-treasurer, El Paso, Tex., is reported as planning to rebuild \$600,000 plant for manufacturing Portland cement and lime.

NEWS OF THE CEMENT FIELD.

Empire Cement & Limestone Co., Atlanta, Ga., capital \$10,000; incorporators, J. H. Davis, Geo. W. Collier, J. R. Collier and others.

The Lawrence Portland Cement Co., Plainfield, N. J., with offices at Seigfried, Pa., will erect plant at Ackerman, W. Va., costing \$500,000.

The Wolverine Portland Cement Co. has mailed checks covering the two per cent dividend declared in January and has declared a second dividend of two per cent payable August 15 to stockholders of record on that date.

Employees of the Standard Portland Cement Co., of San Francisco, while searching for cement rock near the company's plant near Vallejo, Cal., are reported to have discovered a large and remarkably pure deposit of magnesite.

A number of new industries have been established at Augusta, Ga., as a result of the fire. One of the largest of these is the Augusta Cement Products Co., which is making cement tile roofing. W. C. Wilbur is the president; P. E. Wilbur, vice-president; T. W. Thornhill, secretary-treasurer.

The Tennessee Cement & Lime Co. has added another kiln to its plant in Eastern Tennessee, with a capacity of 100 barrels a day, making a total capacity of 400 barrels. Thomas H. Warren is president of the company and H. H. Cox is treasurer. The company has been having a big business and is selling up to capacity.

PROPORTIONING CONCRETE.*

* Summary of paper read before the Concrete Institute of Great Britain, by John A. Davenport, M.Sc., and S. W. Perrott, M. A. I.

In correctly made concrete the amount of sand should be just sufficient to fill the voids in the coarse material, and the amount of cement just sufficient to fill the voids in the mixture of sand and coarse material and to coat all the particles with very thin jointing layers. It is a rational assumption that such concrete will give a maximum strength with the minimum of cost, and if such assumption be justified by experimental results it follows at once that the proportioning of concrete-forming materials is of the utmost importance. Greater strengths can be obtained by the use of excess of cement as in the case of the ordinary mix of 1:2:4, but the increase in strength is less than the increase of cost of materials, and is therefore only justified in particular cases.

The strength of any concrete will depend not only upon the materials and their proportions, but also upon the method of using those materials. Any void in a mass of 3-4 in. coarse material may be filled in many ways. First, it may be filled with cement and sand mortar as in the 1:2:4 concrete; secondly, it may be filled with a piece of stone which practically fills the whole space; and, thirdly, it may be filled with a number of stones which vary in size with a minimum amount of cement and sand mortar shown in black. The first filling is composed almost wholly of joints, and on that account is weak; the second filling is strong, owing to the absence of joints, but it is impracticable; but the third is a compromise which is not only impracticable but also strong. It will be seen that the amount of the variations in size or the grading will depend upon the nature and quality of the work required. On the one hand, there will be good but costly filling, and on the other, a cheap but still good filling, and whether the gradation be large or small the filling will be better than one of cement and sand mortar only.

With a view to testing the effect of "proportioning" upon the strength and other properties, and also the cost of concrete, the authors drew up a series of experiments, the intention being to test compressive strength, modulus of rupture, specific gravity, water resistance, and fire resistance. Various difficulties arose in the course of the work

(Concluded on Page 50.)

ROAD BUILDING

Unloading Crushed Rock by Machinery.

Everyone familiar with the delivery of crushed rock, sand and gravel, and similar cheap commodities, shipped in bulk, realizes that nearly half the cost of handling is always made up of a bill for shoveling which is a very uncertain quantity under the present labor conditions. In many cases it has prevented the prompt delivery of the goods and has been the means of causing an endless amount of dissatisfaction. Very frequently it is simply impossible to pick up a couple of extra laborers, because shoveling crushed rock is not a very attractive job if a man can find something else to do.

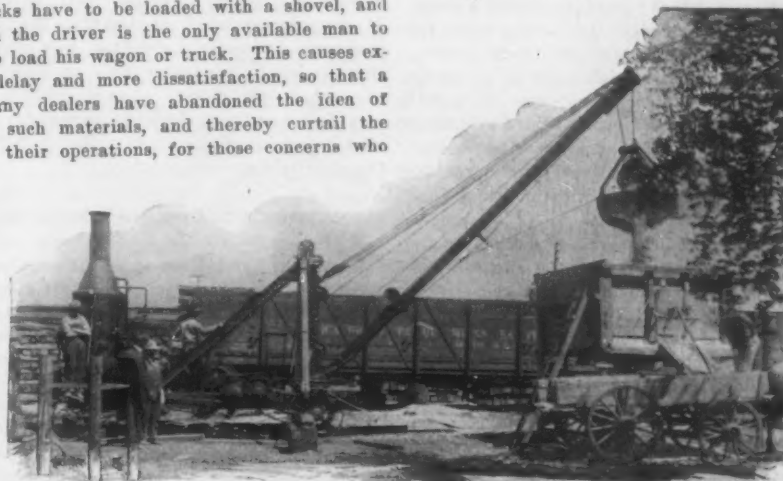
Some dealers and jobbers are fortunate enough to have elevated tracks from which this classification of materials can be unloaded from bottom-dump or side-dump cars into ground storage beneath their elevated tracks. Even then the wagons or auto trucks have to be loaded with a shovel, and too often the driver is the only available man to be had to load his wagon or truck. This causes expensive delay and more dissatisfaction, so that a great many dealers have abandoned the idea of handling such materials, and thereby curtail the scope of their operations, for those concerns who

width outside outriggers (folding) 18 ft.; size bucket to use, $\frac{1}{2}$ yd. clam shell or 1-3 yd. orange peel; length of boom, 20 ft. for heavy bucket, 26 ft. for light bucket; weight complete without bucket, 19,000 lbs.

Frame: Constructed of heavy section deep steel channels, hot riveted, plated, cross braced and trussed. Mast and A-frame heavy steel construction.

Out-Riggers: Heavy steel angles, hinged top and bottom, easily folded out of way. Adjustment secured by screw jacks permanently attached to ends of out-rigger.

Trucks: Three point suspension; propelling wheels 38 in. dia. x 10 in. face x $\frac{3}{4}$ in. tires, to which are attached sprockets driven by heavy steel pintle chain. Propelling wheels equipped with a differential. Steering wheels 30 in. dia. x 10 in. face x $\frac{3}{4}$ in. tires mounted on pivoted axle with 5th wheel and kingbolt, steering by hand wheel and



BYERS UNLOADER AT WORK.

are equipped to deliver crushed rock and sand can command the sale of cement, lime and plaster in very many cases.

In lime with the modern mechanical equipment idea to do away with hand labor in every possible way, the John F. Byers Machine Co., of Ravenna, Ohio, have recently perfected a very ingenious and practical device for unloading cars and reclaiming and loading wagons from stock piles or bins. It is a portable steel clam shell tractor, and consists of a power hoist, derrick and boom with a clam shell bucket that does this work so efficiently that one man operating the tractor and derrick outfit can assist the driver in loading the wagon or truck direct from the car, or from the storage pile or bin with such efficiency as to make the operation a pleasure, in place of the hardest kind of work. It turns the worst kind of uncertainty into a profitable and easily calculated operation.

This tractor is just as efficient in the matter of digging ditches for the laying of sewers or for other purposes as it is for unloading cars, and is guaranteed in every particular. The accompanying illustrations give a pretty clear idea of the appearance of the machine in operation.

A detailed description of the machine follows:

Principal Dimensions: Car body 15 ft. long x $6\frac{1}{2}$ ft. wide; width outside wheels (forward and rear wheels track) $9\frac{1}{2}$ ft.; wheel base 13 ft.; height from ground to top of A frame 12 ft.; (boom easily lowered and stack removed for close clearances);

worm. Axles $3\frac{1}{2}$ in. square solid steel, blocked and trussed, with ends turned down to 3-7-16 in. x 10 in. for wheel bearings. Emergency band brake provided. Wheels drilled for attaching spuds if desired.

Propelling speed forward or reverse, 200 ft. per min.

Power Plant: Engine 18 h. p. by actual brake test; Byers heavy vertical marine type double cylinder; compound geared to 3 drum hoist; two friction drums, with brakes, to operate buckets; drum barrels 11 in. in dia. x 13 in. long; capacity 4,000 lbs. on single line. Third drum raises and lowers boom and is positively engaged by steel jaw clutch. All three drums have steel drum barrels, ratchets and dogs. Boom swinger at front is chain driven from main engine. Winch head is keyed on end of drum shaft for spotting cars. One man operates bucket, boom swinger, boom lift, traction and steering.

Boiler. 32 in. x 70 in. Byers hand made, can be furnished to comply with all local ordinances. All boilers pass Hartford specifications. We recommend steam as the most flexible power, but can furnish gasoline or electric power if conditions demand it.

Boom: 8 in. x 10 in. selected yellow pine or Oregon fir; heavy steel fittings both ends; three rod steel truss full length.

Sheaves and Cable: All sheaves 12 in.; have self-lubricating graphited bronze bushings. All wire rope $\frac{1}{2}$ in. plow steel. Tag line to keep bucket

from swinging; steel tiller rope with counterweight sliding in steel guides on A-frame.

Buckets: Frequently our customers have on hand or prefer to furnish the bucket themselves. For sand, gravel, screenings, small coal and similar loose material, most any light standard bucket does well. But in 1 in., 2 in. or 3 in. crushed rock, slag and such dense interlocking materials, it is very important to have a high powered bucket and sometimes even the addition of teeth. Consequently it is very important to have a bucket adapted to the service, as otherwise results may be very disappointing. If we are to furnish bucket, we should be given accurate information as to the name, size, nature and shape of material. If we do not furnish bucket, you should put it up to the bucket manufacturer to furnish the right bucket for the work. One-half yard is the proper size for clam shell; if necessary to use orange peel, use a $\frac{1}{4}$ yd., as the orange peel weighs nearly twice as much as the clam shell.

GROWTH OF CONCRETE ROADS.

The rapidly increasing popularity of concrete roads is again emphasized in the summary of recent concrete road construction in New Jersey. This insures the construction of larger and larger amounts every year and the universal distribution of the work, together with its simple character, the local production of the bulk of the materials required, the small amount of standard plant necessary, make the building of concrete roads a very important and attractive field for contractors. Little skilled labor is required except for superintendence, and usually men can be secured at moderate prices and with minimum competition from labor organization.

Besides the sand and gravel or broken stone that may often be procured near the site or even be quarried by the contractor at minimum cost, there is little material to purchase except the cement. The plant involved for paving is comprised in a power mixer and ordinary hand tools available for almost any construction work. To these, the addition of excavating, leveling and transporting apparatus, standard for all earth work, and in some cases rock cutting machinery, suffice for the entire road construction and can easily be purchased or even rented in some localities, thus involving comparatively little permanent indebtedness for capital tied up in special plant.

Already various manufacturing companies have foreseen the tremendous importance of the coming work in concrete road building and a number of firms are putting on the market special concrete roadbuilding machines intended to mix, distribute, and surface the concrete with great rapidity and economy, with a minimum of labor.

In these times of unprecedented costs for manufactured materials and uncertainty of the labor market, the opportunity to get a large amount of standard contract work containing few uncertain elements or costly factors should appeal strongly to a large number of contractors. This will enable large operators to keep at least a portion of their force occupied in the interims between other jobs and will provide a most excellent chance for the young contractor to gain experience and confidence and accumulate some profits, build up a business and acquire standard plant that will easily enable him to branch out advantageously in many other kinds of contract work that may be presented later.

Seven years ago there were scarcely any concrete roads to be found in the country; since then more than 51,000,000 sq. yd. has been constructed at a cost of probably not less than \$70,000,000 for the paving alone and a much higher total cost which included grading, draining, and other items, and probably reached \$150,000,000 exclusive of very considerable sums for the construction of earth, macadam and various types of paved roads.

While the cement manufacturer individually and through this association is making a country-wide

educational campaign on this subject—the biggest factor to help spread the gospel of good roads is the small, local handler of builders' supplies. It is upon him that is dependent the delivery to the farmer of farm necessities, agricultural implements, etc. during the early spring months, when the farmers can do little work in the fields, but want to do considerable repair work and new building. The obstacle confronting the farmer is the lack of desire to drive to town through the mud and haul building material or other repair supplies back to the farm. The same objection arises in the mind of the dealer, even those who are now equipped with latter day motor-trucks; he naturally fears to tackle the average country road which the spring thaws have made practically impassable.

Generally speaking, every retailer of every commodity should be a booster for concrete roads—because of the improvement that must necessarily follow to the town in which he lives, as well as the immediate surrounding country.

Specifically speaking, the handler of building materials is the factor who should have this subject of good roads ever before him, because every one of the materials he handles is a necessary part of some improvement—first in the town itself and next on the farms in the adjacent territory. From an increasing of profits viewpoint alone, to say nothing of the general resultant benefits, the additional quantities of cement, hydrated lime and crushed stone requisite for the making of good roads, at once open the gateway to the consumption of greater amounts of the same materials at a time most beneficial to the farmer, the local dealer and the materials manufacturer.

IMPORTANT VOLUME ON CONCRETE ROADS.

The neatly printed volume of "Proceedings of the Second National Conference on Concrete Road Building," has been published by the committee on resolutions. The work of the committee has been very complete and great care has been taken in the matter of correcting the papers and the stenographer's notes of the discussions have in many cases been referred back for authors' corrections. The whole, as published in book form, makes 300 pages in long primer, which is very easy and convenient to read. It is a most valuable and practical volume amounting to an epitome of the best advice, both technical and practical, upon the subject of concrete road building, extant. The nominal price of one dollar per volume has been placed upon this valuable hand book in order to give it the most liberal distribution among those who stand in need of the information contained between its covers. A very comprehensive subjective index has been attached to the volume so that its full usefulness is made available with the minimum expenditure of time. Your remittance of one dollar to the National Conference on Concrete Road Building, 111 West Washington street, Chicago, Ill., will secure for you a copy of your own.

TO BUILD THIRTEEN MILES OF ROAD.

Lowell, Mich., June 19.—Farmers residing along the Belding-Lowell highway are elated over the prospect of securing a state reward road. Already the necessary number of signers have been secured on the petition and the work now is mostly routine from their point of view. The road will connect the corporation limits of Belding with the village of Lowell, a distance of about $13\frac{1}{2}$ miles as the crow flies. This will be the first instance of the application here of the recently enacted Covert act, aside from the Ionia-Lowell road, that has also passed its preliminary stages. This last road will be begun probably in the very near future. The bonds will be taken over by the Detroit Trust company or some bank in that city.

Much of the credit for the road building in this section of the county is due to the indefatigable efforts of Dexter G. Look, a member of the Kent

county road commission and one of the leading druggists of Lowell.

The roads now in course of construction in Kent county are the following: Two miles of concrete road on Grandville avenue adjacent to the city of Grand Rapids; three miles in Caledonia township; four miles north of Cedar Springs to the county line; two miles on South Division south of the city of Grand Rapids.

IMPROVED CONDITIONS AID ROAD WORK.

Louisville, Ky., June 18.—Improved financial conditions, and a gradual return of confidence in fundamental conditions on the part of bankers and financial bears, has made it possible for a number of counties in Kentucky to float their immense bond issues for good roads, and work is now starting off rather lively. At Owensboro, Hopkinsville, and one or two other cities some trouble was observed in selling road bonds at anything like a fair premium, but the bonds have finally been sold and contracts are about to be let. The Christian County issue, at Hopkinsville, Ky., was for \$400,000; while the Daviess County issue, at Owensboro, was \$600,000.

MANISTEE, MICH., GETS BUSY.

Evidence of active progress in constructing good roads in Manistee county, Mich., was furnished last week when a crew of road builders began work of breaking the dirt roadbed south of Oak Hill for a crushed stone road. It is a quarter of a mile in length, and forms a portion of the south approach into the city of the West Michigan Pike.

IMPROVEMENT CONFERENCE DISCUSSES ROADS.

Part of the program of "A Better Community Conference," held at the University of Illinois, Urbana, Ill., on June 20, 21 and 22, was given over to a discussion of "Roads." This session took place on Wednesday, the 21st, in the Commerce building, the program being as follows:

C. A. Kiler, president Illinois Commercial Federation, presiding.

"The Country Road," by S. E. Brady, secretary Illinois State Highway Commission.

"Bond Issues for Road Building," by W. G. Edens, president Illinois Highway Improvement Association.

"How We Carried a Bond Issue in Vermilion County," by Harvey C. Adams, president Chamber of Commerce, Danville.

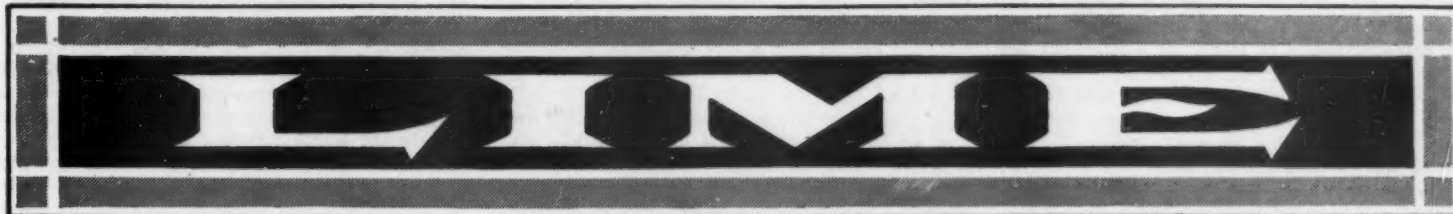
WISCONSIN ROAD BUILDING.

Concrete road building, in which Milwaukee county ranks among the leaders, is rapidly gaining in various Wisconsin cities. This type of pavement is being used extensively by the city of Milwaukee this season in alley work, a large number of contracts having already been let.

Waukesha county has now let contracts for improving Blue Mound road from the end of the Milwaukee county concrete roadway for a distance of five miles. Macadam pavement, fifteen feet wide, will be constructed at a cost of \$36,700. The Municipal Equipment & Construction Co., Chicago, has the work, which will require 44,800 square yards of surfacing.

Booth & Flinn, Ltd., Pittsburgh, Pa., took down sixteen of the seventeen road contracts which were let in this county last week, the total amount being \$404,768.95.

The Thomas-Cronin Co., Pittsburgh, Pa., recently secured the contract for rebuilding the Steubenville pike extension, distance of one and one-half miles, at cost of \$21,023.20, and material used will be asphaltic concrete and slag foundations.



Good Business.

Many years have passed since the lime market has been so completely sold up as at present. In fact, the lime plants all over the country are oversold and are working overtime to fill their orders. There are delays in making shipment of all classes of lime. This unusual condition is due to the extraordinary demand for agricultural lime, which, in turn, is due to the shortage of potash and nitrate fertilizers; and this shortage in its turn is a direct result of the war, which has upset shipments and affected almost every class of merchandise and every business wherever located. More farmers have used lime this year than ever before, and it is reasonable to suppose that many of them have for the first time awakened to the fact that lime is a very valuable material in increasing the productivity of their land.

Make the Formulae Correct.

There is no hard and fast rule by which mortars and plasters can be mixed because the value of the inert portion of the mixture is variable of very tremendous influence upon the results that can be obtained.

For this reason every formula recommended for practice should always be stated with proper limitations in regard to the inerts referred to. To do otherwise is simply a sure way to lead trusting workmen in the field up against certain failure. There has been a great deal of poorly advised, not to say carelessly prepared, specifications freely distributed, with the very laudible aim and purpose of being helpful to the non-technical man in the field, of course. But it really does a great deal of harm, and completely defeats its own high purpose in every case where such a specification causes a failure.

A short time ago we were asked where one could purchase a small amount of double-strength lime, by a man who had inquired of several dealers who didn't keep such an article, but all of whom referred the applicant to us for information. Of course we could only answer that there is no such commodity, but he insisted that other people could get it, and he must have some.

Investigation developed that he had no use for hydrated lime or powdered lime, as he called it, because he had tried it out thoroughly and it had spoiled a job for him, and he was sure that was good and plenty of knowledge on the subject for him. But double-strength lime was different. He knew of jobs where it had been used with perfect satisfaction and complete success—in fact he had worked on more than one job where it was so used.

The party proved to be a very ambitious and successful young contractor, doing concrete work and plastering. He was branching out into the field of exterior treatments, sand floated and coated surfaces, rough cast, pebble dash and the like. A very positive kind of a fellow who knew what he wanted, or at least he was sure that he did.

Humiliated by not being able to help in such a case, which we have long believed to be our sole hope and purpose in this life of materials and their uses, we begged to be informed of the source of supply if found. By and by upon inquiry it was found that the job proceeded, but the first coat on metal lath was beginning to show shrinkage cracks, admittedly as bad as those developed

when the powdered lime had been used.

A glance was all that was needed to comprehend the familiar trouble and its well known causes, but the double-strength lime and its source of supply proved to be more attractive. There it stood in silent solemnity in second-hand flour barrels with no head on top, but covered with burlap doubled under the head hoop. Double strength was demonstrated by the invoice, \$2 per barrel plus 15 cents for cooperage.

Can you beat it?

What's the use, anyway? This shows that all of us fellows who have been working in the National Lime Manufacturers' Association for years to produce more "lime light" are overlooking a few bits. All of our friends and companions in the lime business are entirely too timid. We are all afraid to enhance the reputation and selling status of our products by the only path that nowadays begets appreciation, namely a scalding price.

If Col. Cobb, Dad Howe, Uncle Peter Martin, Charlie Weiler, Bernie McNulty, Rea Hart, anyone of whom are within reach of the locality, or any other top-notch amongst our cronies were to have an employe to perpetrate such a trick, he would promptly take to tall timber and never come back until his beard grew two feet long to disguise his features from himself.

Old Rock PRODUCTS has seen lime and lime, much lime, in many latitudes and longitudes—in many forms, conditions and stages of mixture and processes of application, both overburned, underburned, hydrated, ground, wet, dry and on fire, and some not burned at all but acid calcined. The very worst, most miserable specimen of poorly burned lump lime, derived from rock so full of silicate impurities that it runs at least 30 per cent clinker and core, and calcined in a ramshackle furnace with holes in the sides big enough to throw a brick through, that we have ever seen was contained in those burlap-covered second-hand barrels. And that is what the customer accepted for double-strength lime at \$2.15 per, including the barrel!

To get away with it is the main point, for the invoice was receipted.

That lime burner has been reading the same pages that all the balance of you have been reading for more than ten years, but he never got any such dope from us. He never came to a lime meeting to get civilized or intimidated, but calmly let the man use it double or single or let it alone, just as he pleased about it.

The savage majesty, the barbaric innocence of pure simplicity contained in such a state of mind is inspiring and refreshing in these piping times of modernism with all of its complexities.

Vanished now all of those weeds of humility but recently referred to. True lime light having dawned, with the very crest and strut of the game cock who owns the barnyard, we took that situation in hand. The contractor came down from the scaffold to get his, for by this time he was in a frame of mind to listen to anything that had the sound of help in it.

The trouble did not lie in the lime or the cement or anything else except the richness of the mixture. The sand was of the glacial drift variety, very commonly found in the pits of the northern states. It is largely decomposed limestone with some little quartz and other products of granites and aluminous pebbles. A fairly good sand, as the commercial sands of the locality go one and all. Having

often examined and analyzed the sand there was no difficulty in naming the exact pit from which it came.

Our contractor was sifting two wheelbarrow scoops of sand amounting to $2\frac{1}{2}$ cubic feet, and mixing this with one bag of Portland cement after first smearing the dry sand around with three shovelfuls of lime putty from a box where it had aged for several days. It was some job, too, for the man at the mortar box, let me tell you. He was literally panting, and sweating like a nailer used to do when they forged horseshoe nails, when we were boys. There has never been any such sweating since, until the present occasion. He was ready to quit, anybody would be ready to quit. No such job was ever intended for a human being to do.

Notice the transformation. A bag of hydrated lime was secured in about fifteen minutes. In the meantime five cubic feet of sand had been sifted and placed in one end of the mortar box. A bag of Portland cement was sifted into the other end, one-half of the hydrated lime sifted on top of the cement, and the two thoroughly mixed dry. Then the sand and the cement lime mixture were well mixed together and water with continual agitation was added until stiff "mud" resulted. In a few minutes it became mellow by standing in a compact pile. Then the mud was passed up to the scaffold in pails and deposited on the pallet boards. In less than ten minutes that contractor, his journeyman and the helper on the scaffold were all in a good humor, and the man at the mortar box had caught his breath. Needless to say they all forgot about that double-strength lime as fast as they knew how, and one more working crew was convinced that hydrated lime, the modern easy way, is the only kind to use on a cement plaster and rough cast exterior job. They are now daubing it all over the neighborhood upon every kind of structure from banks, stores and residences to barns and silos. They get the sand from the same pit, use the same hydrate and the same cement all the time in the same way, and get parallel and uniform good results every time.

With that particular sand such a mixture, which is about five to one, will spread easily ahead of the trowel, it will hug the hock, and clinch readily upon the metal lath or other surface to be covered. It will not shrink so as to crack the surface, and it really needs no hair in the first coat mixture, although there is no objection to using a little hair in places where the spacing is very large, and the hair will prevent excessive quantities of plaster from falling back of the lath.

Ottawa silica sand when used for the same purpose will carry six to one. Ohio river sands carry five to one. Fine limestone siftings used as sand carry four and one-half to one, and make a most excellent job when the details are properly worked out. The point to observe is that there is a tendency to spoil all the effect of our improved materials by mixing them entirely too rich. If you have too much cement and too much lime, the remedy is not more cement and more lime, but less of these ingredients. As a general rule cracked cement-lime plaster indicates that it was mixed too rich.

All the trouble with the work of the contractor just related came from a specification or formula that was given to him at the cement show a couple of years ago by some one supposed to be in a posi-

tion to know about such things and engaged in the business of helping to extend the best information for practical use. The specification called for ten parts of Portland cement, one part hydrated lime mixed together first, and then mixed with twenty parts of clean dry sand, with sufficient water to make smooth working mortar. Repeated trials proved this to be a failure, which was attributed to the powdered lime. The alternative of this specification was identical with the above except that lime paste made by mixing double strength lime with water to the consistency of soft putty and seasoned for a week in the mortar box was substituted for the hydrated lime.

Both the formula and its alternate were short more than half of the sand really needed to make a mortar that could yield any good results under average practice. The alternate is altogether impractical, showing that the author knew absolutely nothing of the subject of preparing plastering and finishing materials.

In matters of this kind too much care cannot be exercised to be sure to give out the right kind of information. Very often a failure due to a misleading formula will prevent the success of one who would otherwise be a large user of materials. The same incident repeated ad infinitum would tend to curtail the volume of consumption of hydrated lime as well as cement, sand, screenings, etc., to say nothing of the adverse impression upon the public of failure in connection with the use of the materials of this type.

That Needed Definition.

"Hydrated lime is nothing more nor less than ordinary lump or caustic lime that has been soaked with water, and afterwards had the water driven out by mechanical process, leaving the lime in the shape of a fine white powder, resembling in appearance wheat flour."

Now, would you look at that?

Such is the definition of hydrated lime given to an inquirer by an eminent engineer whose activities constitute the technical control of millions of dollars worth of construction annually. When asked if he believed that such a definition for hydrated lime was currently held by the leading engineers of this country he replied:

"Why, certainly; that covers the case insofar as any one could ever be interested in the matter."

The conversation occurred in the lobby of one of the most popular American hotels. Not far away sat an architect whose genius is expressed in a number of the most magnificent buildings constructed in modern times. A touch of that quality of curiosity that pushed old Dr. Franklin along, suggested the getting of that famous architect's definition of hydrated lime.

He was asked, "What is this hydrated lime we hear so much about? What is the difference between it and any other kind of lime?"

"Hydrated lime is a special preparation of ordinary lime to keep it from getting hot. We do not advocate its use for the reason that we believe it has only about half the strength of freshly burned pure lime. It is much more expensive than pure lime, which we know all about, and there is considerable waste in connection with the use of the bags, to say nothing of their cost."

This was spoken in such a conclusive manner that no one present was inclined to press the conversation further in that direction, but being highly edified by the statements of his eminence we cannot help but wonder how many of his particular classification of humanity still think about hydrated lime in such terms.

This shows what all of us hydrators are up against, for these definitions candidly stated really represent the best knowledge now extant in the minds of the men who have the power to specify the material. Both of those men are entirely forgetful of the fact that the writer long ago pa-

tiently and carefully discussed and explained all of the real facts and benefits and economies of hydrated lime at length, and by their request committed the matter to writing and submitted it for their files.

The expression of the architect, "pure lump lime that we know all about," is such a big joke that it is not worth discussing further here. In fact, the eminent gentleman who uttered those words has but a very vague and uncertain idea of everything relating to lime in any way whatever. He is so ignorant upon the subject that he really has no foundation upon which to begin to receive information, and yet his house confidently assumes that they are working intelligently when they write into each specification, "freshly burned pure lime for all purposes where lime is required in this structure," and upon such generalities thousands of tons of material are annually delivered. The engineer will keep on in his mind, soaking and driving the water out till time limits his activities, for he has reached the point where he absorbs no more information amidst the activity of using that which he has already acquired.

There is no way to reach men of this class, because their minds are in the crystal state, in which their brains are surrounded by a cocoon or tough shell that hermetically seals all avenues of approach. When they receive a marked copy of this article they will barely realize that it applies to them, and so they and all of their kind are hopeless.

But the men who are running the hydrators are almost as bad, for as yet we have never adopted or worked out a definition for hydrated lime that means anything, or is sufficiently exclusive to make the product recognizable. By the definition offered to the American Society for Testing Materials any lime treated with water until it became a fine powder would have to be accepted, no matter whether the water was applied to a bed of lime spread out on the ground with a garden hose, or whether it was thrown into a wet trough and allowed to take care of itself, or whether it was derived from the incidental residue of some chemical process in which the lime was first used to accomplish some other function of atomic relationships.

There are hydrates of all of these descriptions being marketed today as hydrated lime right alongside of the high-grade products by hydrating mills that have the best and most expensive mechanical equipment, and the best possible technical control to produce the best obtainable product. By the testimony of the engineer and architect quoted above one can see how much discrimination is accorded in the matter of hydrated lime. When the kind of goods just described is properly classified as hydrated lime by our own definition, there is only one protection left for the man who makes the real hydrate that cannot be questioned as to its quality, its uniformity and its integrity as a product worthy of its reputation and of its recommendation. That is, to keep the brand constantly before the buyer so that he gets the discrimination of quality by the brand and thus subconsciously learns to classify the brands of good hydrate from those that are just hydrated lime without any brand or commercial names that are known to mean that the hydrate is a poor quality, a mere imitation of the real thing, produced and marketed under the dignified brands that have made and do sustain the reputation of the product.

We take the position that the near hydrates, or imitation hydrates, or whatever else you may be inclined to call them, have no place in the roster of brands of real hydrated lime. For this reason we must have sooner or later, and the sooner the better, a definition for hydrated lime that will give us something more distinct to pound into the engineer and the architect, who really cannot be stirred up into taking very much interest in the matter. It doesn't make very much difference how much each one of us knows about the product, it is what

we are able to make other people know about it that counts.

There is pronounced opposition to the improvement in many localities, where mechanics think it is an imposition to require them to learn something new no matter how much benefit it is to them in the long run. Once in a while an enterprising dealer, in all such cases it is a very high-class man, will tell us that his trade has very little use for hydrated lime, after he has tried to push a carload or two upon them and insisted upon their giving it a fair trial. He is always inclined to keep on pushing because he realizes the advantages to the dealer as well as the ultimate benefit to the workman and the consumer as soon as they have struck the stride.

While all of these are isolated cases, for much more than ninety per cent of the dealers who buy their first carload of hydrate meet with instant success, and will have no other kind ever afterwards, we are working for 100 per cent efficiency. That will mean a buyer waiting for every ton by the time it is produced and ready to ship.

The sales of hydrated lime as yet only amount to a mere suggestion of the possibilities. Over seventy per cent of the dealers have never yet had their first carload, and amongst them are the very men who will be benefited by getting the most satisfying kind of profit out of the advantageous handling, safety from waste and deterioration that is contained in handling hydrate to the ordinary trade of the supply house.

Improvements in Burning and Otherwise.

As the lime business grows into larger manufacturing units, according to the developments of the past decade or more, the cost keeping systems are naturally improved because big operations can afford to have more intelligent management. It is under such circumstances that the economies of kiln practice are perfected. Where the total fuel bill is really an inconsiderable item there is no use of figuring it with a sharp pointed pencil, but when the cost of fuel runs up into thousands of dollars it well behooves the management to know just what they are paying out so much money for and how much of it is actually efficient.

The efficiency of a big plant, for this reason, is higher per ton of output than the old fashioned small plant of one or two crude kilns. Nevertheless, the quotations that come in competition with a little plant that don't waste any money on cost finding systems or any such modern innovations, is the keenest that anybody has to go up against. Probably if there was some way for us to get to these people with something like a clear statement of their unseen and consequently unknown losses, they would be convinced that they were losing money at their lime kilns and making it out of their farming operations or commissary store or some other local asset rather than out of the sale of their lime. Perhaps they would not be inclined to regularly contribute to their customers' prosperity at their own expense, if they really know how to figure their costs.

There is but one sensible way to look at a manufacturing proposition, and that is that the product of the plant should be sold for a profit above the cost of operation sufficient to pay the interest upon the investment and reasonable compensation for everybody engaged in the management, sale and handling of the raw and finished material, as a very minimum proposition. In order to accomplish this, systematic keeping and assembling of all the costs or expenses is indispensable. It is the first guiding principle that leads to economy in the cost of production, in the use of fuel, in kiln practice, and in every other feature connected with the production of lime.

It has been the big manufacturing units who were

first to discover the lack of economy that prevailed so generally in the industry, only a few years ago. Not a single one of the big producers of lime, who have increased the size of their plants in recent years, are now operating by the old-time practices and with the ancient carelessness that surrounded the lime burning business. Today every lime burner wants to know how many pounds of lime he gets from a pound of coal, no matter whether the actual burning is done with producer gas, powdered coal or just mine run coal fired over the grate bars. There are so few kilns still being operated with wood firing that they are scarcely worth considering in connection with modern burning practice.

There is really little or no change in the character of the product that any one can point out distinctly as between that formerly burned with wood and that presently burned with coal, or the products of coal.

Probably a great deal of the reference to quality and satisfaction of the wood-burned product is due to the fact that modern users, and the lime burners themselves, are more intelligent now than in former times, and the demand is for a better product than the old product ever was or could be. We have more comparative knowledge now than we ever had before, and the lime that had a great local reputation many years ago, for the sole reason that it was the one and only kind to be had, sometimes suffers by comparison with a better product that was always better, although in a given locality where it was never seen, it was not recognized as such.

In good times, like the present, when nearly anything in the shape of lime meets with a ready sale, there is a pronounced tendency to carelessness in the matter of keeping costs and assembling them for guidance in another period when economies become much more important. The highest efficiency and economy can only be developed when the lime plant is running at full blast, at full capacity, and when the maximum output is wanted by the sales department, and not when the demand is low and a quarter or a third of the kiln capacity is shut down and under repairs, that initial cost keeping and the study of burning practice is of the first importance.

There has been greater improvement in this respect in the lime industry than in any other line, perhaps, for ten years or more, and very probably better lime is being produced at every one of the modern plants, and in the older plants that have been improved, than was every manufactured in the past.

The study of the burning problem has evolved a great many improvements, such as the use of diluent gases and the introduction of producer gas into the lime kiln. Then there is Philip Dauerenheim's enclosed boiler and Rea Hart's more recent mixture of producer gas and steam, along with Brother Jones and others with the rotary kiln and Schmatola's gassification processes. All of these demonstrate the quest for more economy and greater knowledge of the burning problem, which is so familiar to everybody in the business, as an everyday procedure, that the technique of the proposition is really overlooked to a very great extent.

There are whole chapters yet to be developed on this all important subject, some of which would be complete if all the parts and little pieces known to different individuals could be systematically pieced together. The responses to our recent articles on this subject seem to indicate that numbers of men blessed with partial knowledge upon some of these unwritten chapters would be glad to contribute their part, but they are bashful and backward about it, because they feel that probably other people know as much about it as they do.

To all of these we have to say: For the Lord's sake, do not hesitate with any such idea any longer, for the very people who make a noise like they

knew it all, really lack the least suggestion in their minds of what would constitute an improvement or add new knowledge to the great initial factor of lime manufacture, that of calcining the rock so as to produce perfectly uniform, fully developed lime of the two principal types used in modern commerce, known as high calcium and magnesium lime.

From out of the correspondence growing out of our recent articles on the subject of "The Burning Problem," is the following:

"Editor, ROCK PRODUCTS AND BUILDING MATERIALS:

"In reference to your article on lime burning in your valuable paper I should like to say a few words on lime burning as I have had a variable experience in that business and have used several different sorts of kilns and sold a deal of lime from firms using various kilns.

"As to the old style of kiln in which alternate layers of stone and fuel are used, there is a lot of waste and picking out of clinkers and cinders when the lime is drawn. This means expense.

"The Hoffman kiln is an expensive kiln to use, as the packing in of the stone and wheeling out of the lime is an expensive item.

"I have tried gas and find it the most economical, as there is very little refuse, and if the kiln is built on certain lines there is very seldom any unburnt stone.

"I once had an agency for a firm who burnt their lime in a kiln where the fuel was introduced about half way up the kiln, through doorways. This kiln was supposed to save fuel, and may have done so, but the lime was so powdery when burnt that it was more like whiting and I was informed that the heat was about 1,600 to 1,800 degrees F. and the stone was what one may term, soaked, and took a long time to burn. The powdery nature of the lime made at least 25 per cent of water, and cinders came through to a large extent.

"Using gas, and I have used several different kilns supplied with producer gas, I found I could get more lime from a kiln, say 30 feet high, than with a kiln 40 feet in height. If you get much over 30 feet you lose draught, as the carbonic acid gas is too heavy to get rid of without a considerable draught, and with a deep kiln a lot of the stone at the top is cold and so damps the draught. I believe a kiln 28 to 30 feet in height is the best all around.

"I used to believe in the regenerative system, i. e., that when the lime was drawn below the ports where the gas entered, the air passing through it was heated to meet the gas as it entered, and to a certain extent that theory was correct, but I have found that lime cools so quickly when a current of air passes through it that the regenerative principle merely lasted for an hour or two and long before it was time to draw the lime again, nothing but cold air was entering, so I have taken other means to supply the heated air to meet the gas, without any extra cost in the burning.

"One Interested."

THIRD FIRE IN ONE PLACE.

The new plant of the Granger Lime Co., at West Stockbridge, Mass., was destroyed by fire on June 6, with an estimated loss of \$40,000. The plant was entirely new, having been constructed since March 4, when the old plant burned to the ground. The new plant was completed the day before and the machinery was started in operation for less than a full working day. It is the third fire that the company has had to contend with and detective agencies have been put to work to secure any evidence that might show that the fires have been of incendiary origin. Everything about the plant was made as safe from fire as possible, the electric current being cut out at a great distance from the structure. General Manager Tomlinson and Superintendent George Jasprian cannot account for the fire. Reconstruction of the plant was begun at once without the employees losing an hour.

A Simple Test for Detecting the Pitting of Lump Lime and Hydrated Lime.

(By Dr. Albert Zimmerman.)

In the article in ROCK PRODUCTS, Vol. XV., No. 12, April 22, 1915, a description is given by me of the substance which causes pitting in lime, and as this is in a clinkered form, it is denser or heavier than the particles of slacked lime, and in a diluted mixture they will settle to the bottom more readily than the lime particles and can readily be separated by floating the lighter slacked lime particles from these denser particles constituting the pitting substance as found in lump lime, and this pitting substance is obtained in a concentrated form which is then treated as described later. To hydrated lime, the test is applied without requiring any special preparation before it is mixed for the test.

For lump lime, one pound is used, and this is slacked in a cylindrical receptacle of 4 gallons capacity, the water is added in sufficient quantities to keep an excess during the slacking, with constant stirring, to insure a supply of water to all particles of the lime to allow of complete hydration and give the mixture the consistency of a thin paste. The quantity of water necessary can not be accurately given, as lime varies in the proportion it absorbs of water, fat lime requiring more water and making a larger volume of putty than lean lime, and in the floating, the quantity of water given to dilute the lime was found to be necessary for specimens that gave a large volume of putty, to dilute and thin the fluid sufficiently to allow of the settling of the heavier particles of the pitting substance from the lighter particles of slacked lime. Leaner specimens of lime can be floated with less water, some requiring only half the quantity given, but the larger quantity of 4 gallons as given, works equally well on fat or lean lime.

In floating the slacked lime from the pitting substance, the thin lime paste is diluted with water, slowly added in sufficient quantity to fill the receptacle, and with constant stirring to thoroughly disintegrate the lumps and mix the lime evenly distributed through the water. The fluid containing the lighter particles of lime is now poured off or decanted to within one-fourth the contents of the receptacle, and this again filled with water, the mixture well stirred and again decanted, but this time a larger portion is decanted to leave the sediment with less water, and this operation is repeated 3 or 4 times as may be necessary to separate the lime from the sediment containing the pitting substance. The sediment is then forced through a 20-mesh sieve, any coarser particles are crushed to also pass the 20-mesh sieve. The screened mixture is again floated or decanted to separate the remaining light particles of lime and in this final operation the water is poured from the sediment as close as possible, to leave this containing the smallest quantity of water, that can not be separated without the loss of some of the sediment. The sediment may consist of particles of the pitting substance, unburned lime stone, sand, clay and coal ash, varying for different specimens of lime. The amount of water which it retains after floating has always been under the quantity necessary to make the mixture for the final test, which allows of the addition of water for giving the proper consistency.

To get the pitting effect, the sediment is mixed with a mixture consisting of 1½ ounces of hydrated lime (which has been tested and found to be free from pitting substance) and ¾ ounce of plaster of paris, adding sufficient water to make a thin putty that can be spread upon a glass plate to a thickness of about ¼ inch, then left exposed to the air, which will harden to form a firm coat of plaster upon the glass plate. The quantity of sediment from the greater number of the specimens of lime tested was small, and could be readily mixed with

With the QUARRIES

The Rotten Roads of Illinois.

From the Atlantic Ocean to the Mississippi River there are roads of some kind in every one of the states that deserve the name of highways with one exception.

Massachusetts scores higher than any other state in the number of miles of good hard roads in comparison with the total number of miles of roads in the state.

New York state is next with the greatest number of miles of good hard road, and she is in the same class with Massachusetts as to the high percentage of good roads to its total mileage. There is criticism, however, in New York as to the quality and value of the bridges. According to the law of New York as we understand it, the roads are under the highway commission and consequently are built and maintained under the state government, while bridges are all constructed by local authorities, the highway commissioner only having the authority to locate the bridges.

The old roads of Pennsylvania are proverbial. In this state a definite and systematic attempt was made to provide good roads everywhere before the locomotive was invented, and consequently before there were any railroad lobbies maintained at Harrisburg for the purpose of obstructing and interfering with any legislation that involves any expenditure of a great amount of money not directly beneficial to railroad expansion, as the railroad men saw it for about fifty years. But Pennsylvania already had a very considerable mileage of good hard roads of the old fashioned type, and so she was in very good condition to begin with the new propaganda of laying improved roads, and she is now getting her mileage more rapidly, perhaps, than any other state at the present time.

The next state lying to the west is Ohio, which also began to construct a system of roads, designed at first to connect with the great National Pike, which crosses the state from Wheeling, through Columbus the capital, to the Indiana line at no great distance south of Union City. But the railroads came and broke up the original plan, and for a long time the road improvements of Ohio were in a chaotic state, until the counties began independently to improve their roads. Later on a Highway Commission was provided, and a new system of main market roads and intercounty roads with laterals was undertaken, and great progress has been made which places Ohio in the first rank of the states now securing big mileages each year of improved highways.

Indiana, for a long time was practically a roadless state, for the central and northern part of Indiana was developed very largely after the railroads came. True, the National Pike, which was America's first important good roads undertaking, penetrates the state through the center, on which was placed the capital city of Indianapolis. But a very surprising mileage of good roads have been constructed in Indiana in the last decade, particularly in the northern portions of the state, where previously there had been merely trails with slight attention in the way of improvements, except for the dumping of a few loads of gravel in the worst spots and in stretches where they would otherwise be impassable all the time. Present progress in Indiana is very remarkable indeed, and has been for several years past, so that the roads of that state

make a very good showing. It is easy for the traveler to go nearly anywhere he wants to in Indiana and have a fairly good road all the way.

But when we reach the line that divides Indiana from Illinois, north and south from Lake Michigan to the Ohio River, we come to the jumping-off place. Away back in 1838 the National Pike was extended as far as Vandalia, which was then the capital, and a large part of the grading and bridges were put in for the extension of the road to St. Louis, at first intended to be the western terminus of that great undertaking. But only short strips of this section of the road has ever been built up to the present time. The National Pike, from Vandalia, west to the east bluff of the Mississippi River opposite St. Louis, as it was stated in the old records, was never constructed.

There never has been anything that looked like road excitement in Illinois at any time in the past. The state was developed and filled up with people who came in on railroad trains. They got accustomed to doing without roads, and practiced the system of keeping to home during the winter and other inclement periods of the year, confining their goings and comings for fifty years or more to such times as the sun was shining when they didn't need any road, more than the right of way which gave the general direction for a road.

It is only within the last six years that anybody in Illinois has been willing to listen to road talk. The state is in the worst rut of any of her sisters. The road laws of the state and their application hardly amount to a joke upon the subject.

Once in a while there is a township commissioner who is personally interested in having a road improved to some extent where he can personally benefit thereby, with the result that a mile or two of road gets indifferent improvement. But, taken all in all, there is no such thing as roads in the state of Illinois, although the amount of money available for such purposes by the taxable provisions is as great proportionately as that of Ohio, New York or Pennsylvania, where the tax money really goes into road construction, repairs and maintenance.

The road money of Illinois goes largely to the road officials and their political cohorts, who, for the most part are farmers, having teams with an average hauling efficiency that could be quoted at about \$1.75 per ton per mile.

It is true that in the last two or three years several little stretches of concrete roads have been constructed out of Chicago, and a few hundred miles of indifferent macadam, for the most part laid by the windrow method, letting the traffic roll it into shape, have been built in some of the richest counties, and in places where road material is the cheapest.

Road improvement in the state of Illinois is really and truly a caricature.

Several years ago the legislature provided two crushing plants at the north and south penitentiaries. One located at Joliet and the other at Chester, for the purpose of crushing rock to improve the highways of the various counties in the state. The legislation providing for the crushing plants was exceedingly popular, and there may have been some members in the legislature who were deceived and who voted for the bill, believing that the product of those crushers was intended for the improvement of the roads in the various counties of the state, according to the reading of the body of the bill. But

language is a peculiar thing and according to Shakespeare has been so perverted that much saying always contradicts itself. Now, at the bottom of those penitentiary crushers was the fact that the railroads of the state needed ballast without having to pay for it, other than through demurrage claims and other altogether legal systems of acquiring such materials when not handled according to the rules and regulations. The counties could requisition their supply of road material, which is the same as ballast sizes, and have it delivered by the railroad, the railroad taking as much of the material for ballast as the freight came to and the counties getting and using the remainder of the material scot free for road improvement purposes. The counties furthest distant from the point of origin being encouraged to buy road material would get one car out of six or one car out of ten, or whatever the computation might come to, but always the short end of it because they were getting it for nothing anyway. Then there were rules and regulations with regard to grading, spreading, rolling and other requirements which were not acceptable to the county and township road authorities, which made the penitentiaries-produced material unavailable, and so the wardens of the penitentiaries were forced to sell the product of the crushers for what they could get for it. Very probably the amount secured is very insignificant in comparison to the cost of production. But the gentle people of the state of Illinois are so calloused in their feelings to such trivial matters that they don't even notice such a thing. One would really feel like suggesting to the railroads that it would be a good thing for them to have their Springfield lobbies agitate the matter of the penitentiary crushers, so that the poor, dear, downtrodden railroads can get all the ballast they want without paying for it, because they are contributing so much honor and glory and prosperity to the state, at the very highest charges that the Interstate Commerce Commission and the very liberal state laws will allow them to collect.

This does not refer to the streets and boulevards of the magnificent and wonderful city of Chicago, which are fully equal to the best model highways to be found in the world, but it does refer to the first ten inches beyond the city limits of Chicago, in any direction that you have a mind to go, with a few shining exceptions of improvements that have been made within the last few months. In fact, the roads in Cook County outside of the city of Chicago, are but very little better in quality than that to be found in nearly every other county and locality in the state.

The cities and larger towns of Illinois have in recent years done a great deal in the way of improving their streets, and nearly all of them have a few miles of highway partially improved. But, taking the state as a whole, the roads of Illinois are a fright. They are a disgrace to the present road officials and authorities, and a cumulative disgrace to all of the road officials of the past.

No state in the Union, perhaps, is better supplied with fairly good road making material, being generally distributed so as to make it available nearly everywhere, but the very counties and townships in which rock is abundant and even where crusher plants furnish the principal occupation of the community, they refrain from surprising themselves with so much as a payfull of rock for the improvement of their own highways.

Yet even in Illinois there has been the suggestion of a start made in the direction of improving the roads. Possibly, some day, in the not very distant future, it will be possible to take a ten or twenty mile trip over Illinois roads without encountering engulfing ruts, washouts or bogs where a boat would be more useful than a buggy or an automobile.

The trouble doesn't seem to lie particularly in the Illinois road laws so much as in the application of the same. The people of the state, outside of the big city of Chicago and the smaller cities, have had it drilled into their consciousness for a generation or two that road improvements are impossible to consider on account of their high cost, and not worth the price anyway, because one don't really need to use the roads except at such time as they are in the best condition by the ordinary processes of nature.

Now it just happens that we have had two exceptionally wet seasons, both in 1915 and in the present year, there have been stretches of sixty days in which there was some rain every day, and some days it would rain all day. As a consequence of this the expected summer season for drying up the familiar bogs has not occurred. Last summer the road authorities in the worst places laid down rough floors of No. 2 hemlock planks, but they didn't last very long. They cracked, split and broke up, so that now those very bogs are full of sticks, and a man who tries to pass in the dark is liable to impale himself or his vehicle if he is not very careful.

There are a great many automobiles in the city of Chicago, and they sail along Michigan Avenue and the other boulevards with the grace of a clipper ship under full sail, but just as soon as they attempt to cross the city limits they need a grass-hopper attachment to skip over the waves and clods that have been left by last and this year's inundations.

The reason why Illinois troops are assembled at Springfield right now by railroad transportation is due to the fact that they would never arrive at the capital until the Mexican war is over and settled if they attempted to march over the roads. It is true that old General Grant marched his regiment from Springfield to Cairo rather than have them to ride on the railroad trains, because he wanted them to learn how to march in their home country before they penetrated into hostile territory. It is no wonder that Grant so promptly achieved high military distinction, for having gone over a part of that route, we are convinced that every man in the regiment who reached Cairo must have been a seasoned veteran, and well able to forget such things as distances as soon as they struck the kind of roads they had in Kentucky, even at that early day. The route of Grant's regiment from Springfield to Cairo is very little better today than it was then, so that the evidence is before any one who has a mind to observe it for himself.

There is no system of roads in the state of Illinois, the Lincoln Highway being the first definite trunk road to be laid out since the partly abandoned National Pike of 1838-45. Some little work has been done on the path of the Lincoln Highway in Illinois, some more is being done, and there are a lot of good intentions with regard to all the balance of it. Like another place that the poet spoke of very forcefully, it can be truthfully said that the roads of the state of Illinois are principally paved with good intentions, which don't help very much the day after a heavy rain.

Now there is no malice intended with regard to this arraignment of Illinois roads or the officials who are responsible for the use of the people's tax money set aside for road improvements, but there is a perfect willingness on our part to be suspected of malice, or anything else, if there is any way that can be found to get a small percentage of the good intentions translated into a few tons of good old crushed rock to be spread upon the highways of Illinois. A few loads of hay, or grass or weeds or anything else might be put into the bogs so as to do away with the need of a ferry boat every little while in a ten mile drive.

If the governor of Illinois wants to get acquainted with some people who would really be delighted to have something done about the roads, we will endeavor to introduce him to a few men who would be glad to help him get something on the roads that would look like results, and count for more than the present good intentions.

SUCCESS OF M'GREGORY CRUSHING CO.

The enormous demand for rock material following in the wake of the good roads' movement has made wonderfully profitable some of the Mississippi hill farms of northeastern Iowa considered nearly worthless for agricultural purposes.

An example of quarry development in this locality is illustrated at McGregor, Iowa. Al and Frank Sawvell, brother farmers of McGregor, alert to opportunity, have transformed twenty-five acres of hillside on Bloody Run from a profitless farm to an extremely profitable rock mine. Last summer they opened up a quarry and found the rock tested high. Then they capitalized as the McGregor Stone Crushing Co., bought a big crusher, stone cars and other equipment, put in a side-track and set men and electric power to work grinding up their farm.

The fine dust screenings they are selling as fertilizer for liming the soil and expect to find it a valuable by-product.

LIMESTONE PLANT AT DRESDEN.

Incorporation papers are shortly to be filed of the Seneca Lake Limestone Corporation. The company will develop the limestone quarry near Dresden, N. Y. The plant will have a capacity of 300 tons of ground stone a month. The directors will be: John W. Dreisbach of Allentown, Pa., Harry E. Call of Albany, Edwin M. Stanton of Fayetteville, George B. Goodelle of Geneva, Calvin J. Huson of Dresden. Other incorporators are O. J. C. Rose and C. Willard Rice of Geneva, James M. Lown and Clark Crosier of Penn Yan, Caleb D. Brundage, Ross Huson and Harry B. Harpending of Dresden.

BLAST YIELDS 40,000 YARDS.

The Lightman Stone Co., of Nashville, Tenn., made a blast that attracted considerable attention at its quarry, six miles from the city, on June 8, when it moved 40,000 cubic yards at one pull on the battery. The shot required nearly five tons of explosives, which is more than half a carload. The ledge that was shot was fifty feet deep and the holes were distributed over an area of several hundred feet. It was a highly successful blast, the rock being well broken, and only a very small percentage will require "popping."

The results of the shot will keep the crusher running for several months. It is said to be the largest blast that has ever taken place in this section of the country. The holes were drilled with a well-drill and several months were required for this preparation.

REYNOLDS CO. INSTALLS CRUSHERS.

The Reynolds Asphalt Shingle Co. is installing two new crushers at its plant at Grand Rapids, Mich., for the purpose of crushing stone for coating its composition roofing.

NEW NORTH CAROLINA QUARRY.

The Paul-Morris Co., of Wendell, Wake county, N. C., was chartered on May 28 to do a general quarrying business. The paid-in capital is \$7,500. Charles Paul, of Newsom, N. C., H. C. Morris, of Wendell, N. C., and T. M. Meeum, of Walkertown, N. C., are the incorporators.

The Western Rock & Sand Co., N. O. Harmon, president, has removed from 2600 East Twenty-sixth street, Los Angeles, Cal., to Avenue 20 Bridge.

STUDY CONDITIONS; INCREASE BUSINESS.

"A surprising thing about the crushed rock business is that there is always more to get by going after it."

This statement was made by a salesman who had recently joined the forces of a company having several crushers in a large city. One of the pieces of information he sought on entering the office was the proportion of small to large orders in the total of the company. He found that despite the apparent size of some of the contracts, they constituted only one-third of the total output. The rest—the two-thirds—was picked up in small bunches, two cars here, a car there, a car a month, five cars and so on. Most of the big orders came into the office anyway—so that left a tolerably big field for the new man to work.

Few of these little orders were worth devoting special campaigns to. But they were obviously important. He adopted the practice of knocking about town, finding out what was going on, being in touch with little work as well as big, with the small contractors, with the owners of industrial plants where work was done by the men, with every possible avenue for outlet of crushed rock. And soon results began to appear.

One nice contract was two cars a month, which the builder had been buying here and there, some being shipped in.

One contract was a car a month, on the average, which was used by an industrial company which did its own building.

There were dozens of small contracts from owners of businesses who had been doing their own work on minor structures, walls, etc.

A surprising thing about many of these contracts was that the purchasers had never "shopped" for their crushed rock. They had been taking what was supplied them by the first comer. In one instance the rock being used was much below the quality which should have gone into the work, the builder was hampered by irregular service, having often to suspend his operations to wait for rock, and paying more than the market price for it.

"With a good product and service behind it, there is no trouble at all to sell rock," said the salesman. "There are hundreds of little jobs coming up all the time that make a big volume in the aggregate, that simply fall into one's hands when one is looking for them. I used to think a contract wasn't a contract unless it called for half a dozen or more cars. But since I have been keeping my eyes open, I find that the big business of building is the small business that comes in comparatively small orders. It's worth looking out for and capturing."

NEW INCORPORATIONS.

Chico Crushed Stone Co., Chico, Texas. Capital, \$25,000. J. W. Barnett and others.

Hydraulic Stone Co., Cocoa, Fla. Capital, \$20,000. J. M. Sanders and others.

Oley Valley Quarry Co.; J. H. Bucher, treasurer, Boyertown, Pa. Capital, \$7,500.

Seneca Lake Limestone Corp'n, Geneva, N. Y. Capital, \$10,000. E. M. Stanton and others.

Stone Products Co., Bartow, Fla. Capital, \$10,000. John T. Burrows and others.

Thurlock Stone Co.; Richard B. Turner, treasurer, Chester, Pa. Capital, \$5,000.

Stone Products Co., Bartow, Fla., capital \$10,000; incorporators, John T. Burrows, president; Ellis Gibson, vice-president and secretary; E. L. Wirt, treasurer.

Chico Crushed Stone Co., Chico, Tex., capital \$25,000; incorporators, J. W. Barnett, B. L. Morris and Arthur S. Goetz.

Business is quiet at the quarries near Baraboo, Wis., according to reports from that city. The White Rock quarry has a few men at work but most of the contracts have been filled. At the La Rue quarry a small crew is still at work. Indications are for a revival of business very shortly.

CLAY PRODUCTS

CLAY PIT AT BRAZIL OPENED.

The American Sewer Pipe Co., located north of Brazil, Indiana, is making preparations to open a clay and shale pit for supplying the plant with the necessary material for the manufacture of sewer pipe and other ware. Excavation for the starting of the pit was begun recently. Later a large steam shovel will be installed.

The company owns a large tract of ground, which is underlaid with coal. As soon as the pit is in operation the old mine that is now in operation will be abandoned. The roof in the mine is in bad condition and falls of slate and cave-ins have caused the company considerable trouble.

NATIONAL FIREPROOFING CO. ENLARGES PLANT.

The plans of the National Fireproofing Co. for the enlargement of their plant at Port Murray, N. J., which were completed recently, call for a new factory about three times the size of the present structure. It will be located near the present office. The building will also be equipped with the latest improved brick-making machinery. The power plant will have two boilers, each double the capacity of the present boilers.

It is planned to double the capacity of the plant in ordinary times, and in a pinch the power and size of the new additions will allow the plant to turn out three times the present supply.

The enlargement of the plant will also mean the doubling of the present force of employees. About sixty men are now employed, but when the new factory is in working order the force will number more than 100 and possibly 125. One reason for the addition is the fact that the clay at Port Murray is better adapted to the new rough-faced interlocking brick that the company has just patented.

IOWA ENGINEER POINTS OUT CLAY POSSIBILITIES OF STATE.

"Iowa could be the greatest art pottery producing state in the union if she would simply develop her unlimited deposits of high class clay which lie along the Des Moines river and its tributaries," recently stated H. F. Staley, ceramic engineer at Iowa State College.

In view of this, the department has announced its intention of hiring next fall an eastern art pottery expert to co-operate with Mr. Staley in tests to be carried on to demonstrate the unsurpassed quality of these deposits. They will produce an exhibit that will be shown at the state fair and elsewhere.

"These deposits are just as high grade a clay as is used in making Rookwood, Van Biggle or any of the other high class potteries," says Mr. Staley. "Iowans need to be awakened to the enormous possibilities of developing this industry."

UNREST OF CLAY WORKERS.

The clayworkers of Brazil, Indiana, during the past month have caused a certain degree of uncertainty in the regular production of clay products in that territory by declaring a strike in some of the important manufacturing establishments. Following the walk-out of about twenty men in the machine gangs at the Indiana Paving Brick and Block Co. June 10, about thirty wheelers at the Brazil Face Brick Co. plant,

better known as the Sheridan, quit work on June 12.

The men at the Indiana plant assert they quit work because a bonus which had been promised them was not paid by the company, and immediately they established a demand for \$1.85 a day.

At the Sheridan plant the wheelers demanded ten cents more on the thousand for handling brick, making 35 cents a thousand instead of 25 cents. The men at both plants asserted that they find it impossible to live on the money received.

The strikers declared they did not intend to make the strike general since other plants are already paying above the minimum demanded.

EASTERN BRICK MARKET SLOW.

New York, June 18.—There are conditions prevailing in the eastern brick market that are almost unprecedented. Contradictory factors are making for high prices while the demand is light, manufacture is curtailed, shipments are hampered, because of the tremendous demand upon the part of railroads for lighters and scows to move material coming into this market over their roads, and there is a hesitancy about going ahead with operations because there has seemed, up to the present time, almost no limit to the possibilities of price advances beyond reasonable limits.

Current quotations run from \$7.75 to \$8.25 a thousand. This price is for Hudsons and Raritans. The lower level represents prices for run of yard brick. The top level is for selected culled brick. The usual figure at which this commodity is moving today is about \$8.

Demand during the first part of this month has been seriously curtailed because of wet weather and an apparent determination on the part of builders to hold off operations if the cost of materials was to go up any higher. At the present time it looks as though the apex of the up-curve has been reached and that normal conditions of demand are about to develop. Some things still await readjustment, however.

MIDDLESEX ASSOCIATION ELECTION.

New York, June 18.—The annual election of officers of the Middlesex, N. J., County Clayworkers' Association was held on June 8, at Perth Amboy. All the officers were re-elected with the exception of Albert Boynton, secretary. His successor is Louis Huntress, Jr., Metuchen, N. J. Mr. Huntress is with the Didier-March Co., Perth Amboy.

Most of the clay workers present discussed freely the future of the clay products situation following the close of the war and the prospects of continued prosperity in the eastern market. The consensus of opinion seemed to be that everything depended upon the attitude of other building material manufacturers in bringing down the price of materials to within the reach of prospective builders.

PITTSBURGH MARKET STEADY.

Pittsburgh, Pa., June 19.—Brick companies seem to be getting their share of the business, although it cannot be said that trade is increasing very much. Paving brick men are much better satisfied with business than last year. Orders are plentiful and prices are decidedly better.

NEW INCORPORATIONS.

The Moscow, Idaho, Fire Brick & Clay Product Co.; capital stock, \$500,000.

Bessemer Brick Co., Monongahela City, Pa.; capital, \$10,000. J. A. Spence, treasurer.

Drake Brick & Tile Co., Bennettsville, S. C.; capital, \$6,000.

The Fields Brick Co. of Chester, Pa., are planning to double their output by July 1 and install additional machinery.

C. E. Foster, Ashur Johnson, E. C. Swanson, of Warren, Pa., have organized the Colonial Brick Co., which will operate under a Pennsylvania charter.

The Puritan Brick Co., at McArthur, O., has resumed operations after having been shut down about two months.

Standard Brick Manufacturing Co., Evansville, Ind., increased its capital stock \$50,000, making the total capitalization \$100,000.

Simplex Brick Co., Inc., Manhattan. General contractors, manufacturing brick, clay products, etc.; capital, \$100,000. Incorporators: W. J. Kindgen, 2043 Valentine avenue, Bronx.

The DuBois Clay Manufacturing Co., capital \$16,000, of DuBois, Pa., has been organized by A. S. Moulthrop, M. E. Bouer and S. J. Schrecongost, of that place, to manufacture clay products for the glass trade.

Maurice Clay Products Co., New Philadelphia, Ohio, capital \$100,000; will begin operations July 1. Near the same place, the Dennison Clay Co., which was organized two months ago, will begin operations within sixty days.

The Harbison-Walker Refractories Co., Pittsburgh, Pa., has installed a big rotary kiln at Chester, Pa., for calcining raw magnesite. This was formerly imported, but the company is now buying the raw material and finishing it out at its new plant.

The Montgomery, Pa., Shale Brick Co., to manufacture brick machinery and to deal in clay and clay products; capital, \$100,000; incorporators, H. W. Willett, Sellersville, Pa.; John E. Fluke, Jr., Norwood, Pa.; Clara L. Kirkpatrick, Philadelphia, Pa.; Caleb E.

The Moscow Firebrick and Clay Products Co., Moscow, Idaho; capital, \$500,000; incorporators, Warren Truitt, F. S. Shoesmith, A. S. Lyon, H. B. Mickey and John Nisbet. The new company owns valuable deposits of brick, terra cotta and fire clay five miles from Moscow and plans on the erecting of factory buildings at or near that city.

THE SEWER PIPE BUSINESS.

The sewer pipe business, while it has had its fluctuations, the production some years going below that of previous years, they have not been so wide or so frequent as in brick making proper, and the sewer pipe trade has shown a pretty steady gain during the last twenty years.

The geological survey reminds us that the brick business has more than doubled in twenty years. The sewer pipe business has done even better than that. Twenty years ago, in 1894, the total value of sewer pipe manufactured in the United States was \$5,989,923. The total production for the year 1914 was valued at \$14,014,767. The sewer pipe business has really shown a gain in this country of practically (Concluded on Page 50.)

GYPSUM PRODUCTS

Labor Conditions Affect Gypsum Industry.

The gypsum industry of the country has been hit as hard by the condition of the labor market as any other manufacturing enterprise. Not only has the price of labor soared to figures never before heard of, but labor is hard to get at any price. Especially in the east is this scarcity noticeable. In the quarries of Nova Scotia the shortage has become so severe that shipments of gypsum have been curtailed and manufacturers depending upon this source for their raw materials have been hard pressed in attempting to satisfy the existing demand. This condition will most likely continue throughout the summer and perhaps longer.

This increased cost of labor, together with advances on coal and the supplies needed in gypsum plants, has compelled manufacturers to increase prices of the finished product, but it is generally believed that the additional charges have not been sufficient to offset the increased cost of production.

The conditions confronting the producing end of the gypsum industry have caused the calcined plaster market to be rather uncertain, but normal conditions are again prevailing in practically every section of the country. Building is flourishing in some cities, and low interest rates are stimulating building among investors and owners who have been inclined to postpone activity along this line. Reports show a healthy increase in the number and value of permits over last year and speak well for the plaster business of 1916.

All Gypsum Products Moving Nicely.

In addition to gypsum plaster, specialties in the gypsum field, such as partition tile, plaster board and kindred materials, are said to be moving nicely. The use of gypsum tile for partition purposes is increasing daily. In large cities the use of this product is becoming popular wherever a rearrangement of offices, work room and stores is desired. There is very little if any antipathy on the part of workers toward this material. The ease with which it can be handled and installed seems to appeal to owners and contractors, and possibly accounts for the strong demand which has greeted it ever since its promotion on the part of manufacturers.

GYPSUM PRODUCTS IN BUILDING CONSTRUCTION.

The value of gypsum products in building construction was the subject of a recent illustrated lecture delivered by Wharton Clay, architectural engineer of New Orleans, La., before the Contractors and Dealers' Exchange of that city. Mr. Clay, who has appeared before the leading architectural clubs and universities in the United States, lecturing on fireproof, sound-proof and modern construction of buildings, was induced by the Hon. Walter F. Jahnecke, whose firm, Fritz Jahnecke, Inc., is a large dealer in gypsum products, to deliver the lecture. Taking gypsum as a fireproofing material, Mr. Clay illustrated with pictures and in words its value as he has found it as a student of fireproof construction. He showed how it is taking the place of the old lime and sand mortar, affording a hard, durable wall when used as a plaster and finish, while in pyro bar or block, it is a fireproof, sound insulating material for partitions. The sackett boards made of it are

the most modern foundation for plaster, as he demonstrated, taking the place of the old-time wooden lath, eliminating the danger of fire afforded by the wooden lath, deadening sound, insulating against heat, and resisting fire.

In support of these claims for the gypsum products as employed in building work, pictures were shown proving how much faster lathers and plasterers can work with the sackett board than with the old-fashioned lath, and showing a house, one-half of which was constructed with gypsum materials and the other of ordinary wood construction, when it was set on fire. The wooden half was, of course, entirely consumed by the flames, while the portion constructed of gypsum materials was practically unscorched, the flames subsiding when they reached it. The one-third extra cost will, of course, be an impediment to the progress of this new material into general favor and use, but eventually it will become universally employed in the construction of buildings, as it will be realized that anything which will tend to make a structure more fireproof is more desirable than wood and other inflammable materials.

OLD PLASTER IN SOIL.

Old plaster can be pounded up and used on any soil with advantage, even on the soil that is to be used in growing plants in the house. It has been the custom, in the tearing down of houses, to haul away all the old plaster and dump it into a hole, or overboard, or bury it. It is very valuable in our soils to neutralize the acid caused by decomposition of organic matter. Also it helps supply the lime used in the bodies of plants. It is harmless and can be used in large quantities, as it has lost all its caustic properties. Such plaster ground up ought to be an article of commerce in our cities, where amateur gardeners cannot readily buy ground lime rock or lime rock screenings.

PLASTER MILLS FACE FIRE HAZARD.

Due to the almost impassable condition of Butterworth street, S. W., the plaster mills district of Grand Rapids, Mich., faces a fire hazard, according to a report by Fire Marshal Boughner to the board of police and fire commissioners, submitted last week. The fire marshal declared the street to be almost impassable, and he asserted that the apparatus would be considerably delayed if a fire should break out in that district.

Members of the board were of the opinion that the district should be given fire protection, inasmuch as the mills are a valuable adjunct to the city, although they are situated outside the city limits, and the matter was referred to the common council.

The New Idea Plaster Board Co., which will manufacture a new type of plaster board at South Milwaukee, Wis., will soon be located in its new factory. Construction work is rapidly nearing completion. The walls are of solid brick on a heavy concrete foundation, which has dimensions of 200 by fifty feet.

The Superior Plaster Co., Detroit, Mich., has been incorporated with a capital of \$25,000.

Oakland Plaster & Supply Co., Oakland, N. J.; capital, \$50,000; manufacture and sell plaster, building materials, etc.

GYPSUM AS A VALUABLE RAW MATERIAL.

A few months ago there appeared in the *Tonindustrie-Zeitung*, published in Berlin, Germany, some interesting comments by Theodore Neitzke on the subject of gypsum products, which are presented herewith:

There is indeed no raw material of an external appearance which has had so great an influence on the arts of manufacture as gypsum rock. From this raw material has sprung the different products such as common gypsum (*düngegips*), jointing gypsum, dressing gypsum, stucco gypsum, modeling gypsum, marble cement, floor gypsum, etc. The price of the separate products has varied a very great deal. Even then, however, the individual price is not as large as the different kinds of steel for railroad rails, beginning as fine as a watch spring until they are very large, so that indeed it appears to an outsider, why do not all gypsum manufacturers work their price up by experiments to the highest notch? Moreover, it is to be noted that the demand is after all very small for quantities of this expensive and valuable product. The demand for marble cement is so small, for instance, in comparison with stucco gypsum, that out of 1,000 sacks of stucco gypsum only one of marble cement is needed. Nevertheless, it will be very much desired, if there comes to the knowledge of the manufacturer, how much raw material can daily be worked from the poor quality product. The trouble to produce the finished pure gypsum is not in my opinion as important or lessened by the capacity for completion. Gypsum is like lime and cement—a plastic material. These are produced usually with moderate increase in processes, whereby the plaster becomes considerably cheapened. Should the gypsum industry not be in the position to produce gypsum so that it mixes with sand and yields a serviceable plaster?

The foregoing article brought forth the following reply from E. Dähling:

The question at the end of the previous article is easy to answer. Gypsum can be mixed with sand, yet the solidity of the plaster diminishes greatly in comparison with the pure gypsum plaster. A comparison with the plaster substitutes, lime and cement, is not entered upon, for both products can be used in the pure state with plaster to produce a ready cement. Without the addition of sand this product becomes too compact. The pure lime paste is transformed into plaster, hardening, however, only on the surface, since in the hardening through which the necessary carbonic acid forms, a compact film of carbonic acid lime prevents a further penetration in the plaster mixture. Cement used alone for such mixes (does) very well, but diminishes in strength.

It appears to be unknown to Mr. Neitzke that there are distinct gypsum products mixed with sand placed on the market, so that of course all these are not to be treated as gypsum without qualifying by a special classification, as for instance, lime, awalit and similar designations. The trouble with most gypsum manufacturers in using pure gypsum proceeds from the opinion that gypsum production diminishes if it is diluted when manufactured into plaster. If the apprehension is based on this, let it be put aside. It requires only to become familiar with the construction of gypsum ceilings and gypsum walls, on which gypsum is always used at increased cost. It is becoming too expensive in building construction to use pure gypsum.

SAND and GRAVEL

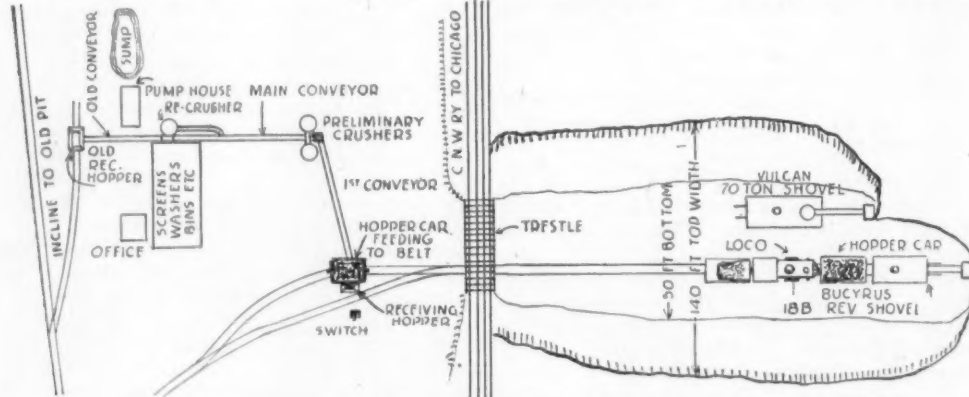
Very Successful Redesign of Plant.

The successful operation of a sand and gravel outfit upon a large scale usually begins with what is considered to be, or in times past was considered an inexhaustible supply of the material. However, with modern equipment and the improvement in transportation facilities, the outputs of commercial plants in the last few years have been increased from a hundred or two cubic yards per day from the largest plants to 1,500 yards as an average and 5,000 yards in several prominent establishments.

For more than ten years the Atwood-Davis Sand Co., of Beloit, Wis., have been working a very excellent deposit of sand, the principal part of their tonnage being shipped into the Chicago market. More than two years ago they realized that at the rate of their withdrawals of materials the time

property for more than half a mile as a part of the regular operations of the plant. The company has a big seventy-ton Vulcan steam shovel and this was started in the direction of the new property. Tracks were laid and a work train made up consisting of the locomotive, a hopper bottom car and a revolving Bucyrus steam shovel working with a three-quarter yard dipper.

The accompanying diagram shows the layout of the property and indicates the position in plant of the work-train and the steam shovel. A special tender was attached to the locomotive for the purpose of keeping a constant supply of coal on hand sufficient for a day's run for both the steam shovels and the locomotive. This extra coal bunker was loaded every night by the night man and the material taken out in excavation being well up to the average quality of the output, was turned into a



PLANT AND PIT OF THE ATWOOD-DAVIS SAND CO.

would come when they would have to redesign the plant, and decision was made in the early part of last summer to proceed with the needed improvements and extensions.

A study of their sand pit demonstrated the fact that in the direction in which it was being operated it was rapidly running out, while upon the other side of the Northwestern railroad right of way the deposit continued to get better, both as to the mixture of the natural materials and to the working conditions. It took several months to work out all of the details to acquire twenty acres of pit land on the other side of the railroad, and gain the co-operation of the railroad for the purpose of digging through to the new properties.

George B. Harker, the superintendent of operations, arranged the plans of digging the great connecting trench which tunnels under the railroad track and extends to the opening up of the new

commercial product. In this way the operation of trenching and tunnelling became one of profit instead of a matter of cost.

The average output per day, from the outfit working in this way, was about 1,350 yards in ten hours.

The new plant now operating on the new property is equipped with Stephens-Adamson Manufacturing Co.'s machinery, as was the old plant, mainly after the design of George B. Harker, the superintendent of the Atwood-Davis Co. It is electrically operated throughout with unit motors of the General Electric type. The material is fed from the hopper cars on to an 8-ply, 30-inch conveyor belt measuring 115 feet in length, between centers. This belt has an elevation of 22 feet and is driven by a ten H. P. motor. It delivers the material over a taper-bar grizzly. This grizzly has 16 bars 9 feet long spaced $1\frac{1}{4}$ inches on the upper or delivery end and $1\frac{1}{4}$ inches on the lower end, in order to prevent clogging. The oversize is fed to a pair of No. 4 Gates crushers which reduce it to $1\frac{1}{4}$ inches. The two crushers are only used when the plant is fed to full capacity. The advantage of having the pair is obvious, as under ordinary conditions, one may be used while the other is being repaired, without delaying operations. These crushers are driven by 20 H. P. motors.

From these crushers the gravel is fed on the main conveyor belt on top of the sand and small gravel that passes through the grizzly screen. This belt is 8-ply, 30-inch and 374 feet long. It carries the material to the top of the plant, where the recrushing, screening and washing machinery are placed.



THE TRAIN AND TWO STEAM SHOVELS CUTTING THE TUNNEL.

ing, screening and washing machinery are placed. Gravel over $1\frac{1}{4}$ inches in size is recrushed by a 36-inch Symons disk crusher driven by a 35 H. P. motor.

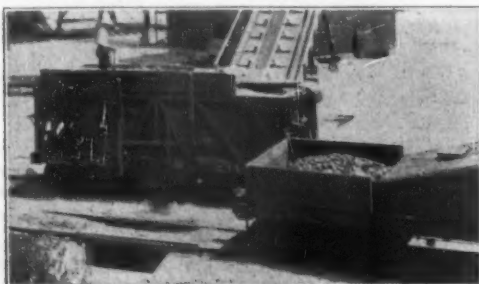
The washing and screening plant consists of 6 sets of screens which screen the gravel into four different sizes. These screens as well as the main conveyor, are driven by a 35 H. P. motor. The last two sets of screens deliver what is known as the No. 2 and No. 0 sand into four settling tanks, two for each screen. Here the sand is separated from the mud and clay which passes off in solution. All four of the settling tanks were designed and built under Mr. Harker's supervision.

The water for the washing plant is obtained from a sump 250 feet long, 40 feet wide, and 8 feet deep, in which a good supply is always obtainable, as it is dug below the water level.

The general layout of the plant, the individual hopper cars, the method of working the through cut with profit, the construction of the bridge under the railroad track and the numerous details involved in the successful operation of such a plant with only two days' shut down in the whole time, and without interrupting the railroad traffic at all constitutes a very signal achievement for Superintendent Harker and his associates in this work.

United Rock Sand Co., Wilmington, Del.; capital, \$200,000; to manufacture cement, plaster, lime, etc.; incorporators, George W. Dillman, M. L. Horty, K. E. Longfield, all of Wilmington.

The Carmichael Gravel Co., Williamsport, Ind., increased its capital stock \$100,000, making the total capitalization \$150,000.



HOPPER BOTTOM CAR FEEDING BELT CONVEYOR.



GENERAL VIEW OF THE ATWOOD DAVIS PLANT

JEFFREY MANUFACTURING COMPANY OPENS NEW BRANCH OFFICES AT DALLAS AND ST. LOUIS.

The Dallas office of the Company will be located in the Commonwealth National Bank Building, and will be in charge of Mr. J. U. Jones. With twenty years of successful salesmanship to his credit, and a thorough personal knowledge of the state of Texas and the requirements of its buyers, Mr. Jones is especially well equipped to take care of the constantly increasing demand for Jeffrey products in his vicinity, and render valuable assistance to clients in solving their elevating, conveying and transmission problems.

Mr. W. V. Cullen has been placed in charge of the St. Louis office, with headquarters in Room A-21 of the Railway Exchange Building, which office has been opened in order to supply the many requests from manufacturers in and about St. Louis for advisory service in connection with their conveying and power handling problems. Long experience in sales engineering work, and training in the application of Jeffrey products especially qualify Mr. Cullen for handling this work, and he will appreciate the opportunity of serving any who may be in need of his assistance.

TRUCK CATALOG FULL OF FEATURES.

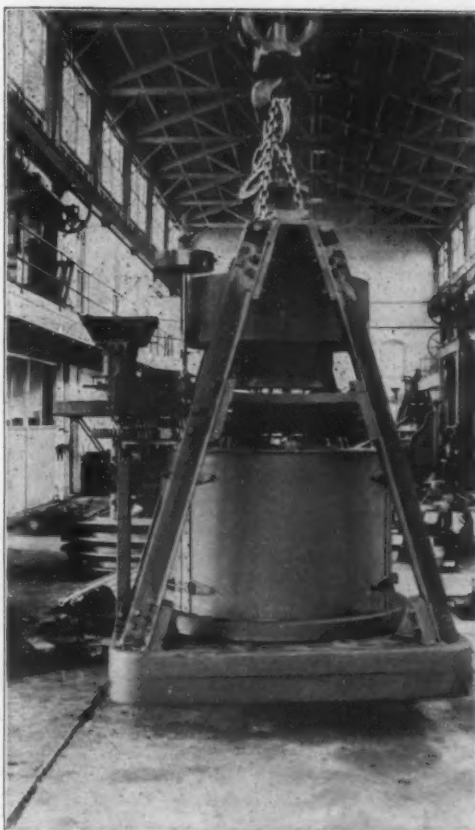
The catalog just published by the Locomobile Co. of America, Bridgeport, Conn., describing and illustrating the company's "Riker" motor truck, may well be said to be full of features. With the catalog is being distributed a book of testimonials with the title, "What Our Trucks Are Doing," which has likewise been given a good deal of thought.

The catalog is of letter size and can be filed with correspondence. It has very readable type and numerous illustrations showing body types suitable for practically every industry. The book shows a number of trucks in use on road work, delivering various kinds of building materials, coal, etc. It should be in the files of every dealer and producer in the country.

TRADE NOTES.

The "Kahn Road Book" is the name of a 128-page publication on permanent concrete roads, just issued by the Trussed Concrete Steel Co., of Youngstown, Ohio, which is devoted to useful information and illustrations on concrete road construction. The first part of the book contains a general historical review of concrete pavements with detailed information regarding particular sections such as Wayne county, Mich., and the surrounding suburbs. The reports of road commissioners are quoted on the satisfaction of the roads and on questions of maintenance. Tables are shown giving cost data as well as summary of the yardage and mileage throughout the country. The reinforcing of concrete pavements is freely discussed and information on Kahn road mesh is included. The necessity and advantage of expansion joints and the protection of edges occupy another section of the book, including in it practical information in regard to

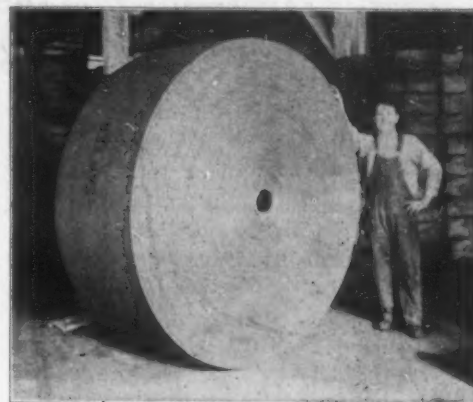
Kahn armor plates and installing device. Complete specifications with interesting illustrations on concrete highways occupy the next section of the book, the one-course concrete highway, one-course concrete street pavement and the two-course concrete street pavement are covered by these specifications. Diagrams covering templates, bridges, etc., are included. Of interest in connection with pavement construction are concrete curves, with methods of protecting the edges and the installation of these curve bars, as well as concrete culverts, bridge floors, etc. Tables giving quantities of materials for concrete and mortar are also included. The Kahn road book is issued primarily for engineers and contractors interested in pavement and road construction and should prove of great value to city engineers, county engineers, road commissioners, contractors and dealers. A copy will be sent upon request by the Trussed Concrete Steel Co., Youngstown, Ohio.



BRADLEY PULVERIZER CO.'S LATEST GIANT GRIFFIN MILL.

The Bradley Pulverizer Co., Allentown, Pa., reports that they have recently made another consignment of Giant Griffin mills to the National Cement Co., Caracas, Venezuela. This is a repeat order as this company started using this type of grinding machinery two years ago and have now replaced all of their grinding machinery with this type of mill. They have also made some very large shipments to the Lehigh Portland Cement Company, Allentown, Pa., Clinchfield Portland Cement Corp., Kingsport, Tenn., Standard Portland Cement Company, Leeds, Ala., Lawrence Portland Cement Company, Siegfried, Pa., and in addition to this have exported a great many mills to England.

The Gardner Governor Co., Quincy, Ill., has perfected a tool for roughening the surface of stone and concrete sidewalk and floor slabs which performs the roughing operation with great efficiency. The tool is a case hardened steel block with sixteen sharpened raised points as shown in the accompanying illustration. The block is provided with a wire handle which helps to guide the tool. In chipping around cracks, posts, columns and the



A 300-TON SAWYER CONVEYOR BELT.

like a trimming tool is used in the close angle. The tool is adjusted as the bit of an ordinary plug drill; driven by compressed air and a complete outfit for using the tool consists of an air compressor driven by a gasoline engine of suitable details of construction to supply air to the plug drill through a hose of such length as may be handy for the working of the apparatus. The roughing of surfaces for repairing and resurfacing is a very important feature to make field practice complete.

Wouldn't it be an interesting sight to see this mammoth Sawyer conveyor belt after it has been installed? Maybe at a later date we will be able to show a picture of it in operation, but just now the belt has hardly had time to reach its destination, as its manufacture has but recently been completed.

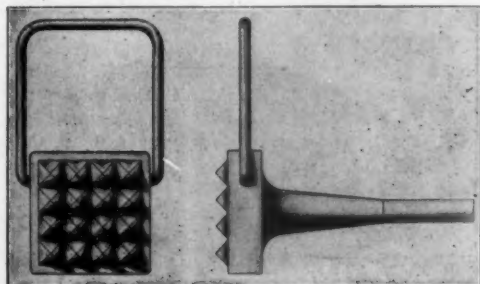
Just imagine, if you can, a three-ton conveyor belt—6,155 lbs. to be exact—measuring one thousand feet long, thirty inches wide, and eight plies thick. When it was completed and rolled, it stood half again as high as the average height man.

This belt was purchased by one of the largest railway systems in the world, and will be used by them as a conveyor. Needless to say, the quality of a great many makes of belts was thoroughly investigated before the order was placed, and it is not surprising, then, that Sawyer was commissioned to make it.

Folder No. 64 has just been published by the Chain Belt Co., Milwaukee, Wis., and gives data on the traveling water screens manufactured by this company. The water screens are designed primarily to remove refuse and foreign material from water before it enters power plants, steel mills or any other industrial plant requiring large quantities of clear water. The folder contains illustrations of the traveling water screens in actual use, together with a diagram showing the manner in which these screens have been installed in the northwest station of the Commonwealth Edison Co., Chicago, Ill. Copies of the folder may be had upon request.

The Schaffer Engineering & Equipment Co., Tiffin, Ohio, have recently issued a booklet descriptive of the Schaffer Poidometer, which is the most accurate and durable weighing machine to be found, and has a very wide range of applications due to the fact that it measures solids and liquids in rigid proportions and has great capacity with perfect accuracy. The booklet is worthy of the study of all those who have manufacturing processes that require positive proportioning of mixtures with several materials.

The Trussed Concrete Steel Co., Pittsburgh, Pa., is working there on the Nicola warehouse, eight stories high. The company is also figuring on a big warehouse for the Baltimore and Ohio Railroad in the produce district. It reports some corporation work going forward, but not so much general activity as two months ago.



THE GARDNER PNEUMATIC ROUGHING TOOL.

A SIMPLE TEST FOR DETECTING THE PITTING OF LUMP AND HYDRATED LIME.

(Continued from Page 43.)

half the quantity of hydrated lime and plaster of paris given, but to make it cover all variation, the proportions as given were used. The proportion of plaster of paris in the mixture influences the pitting. With a higher proportion, the mixture becomes harder and stronger and resists more the expansion of the pitting material and reduces the force or pressure necessary to blow or pit the surface, and the pitting will be developed more slowly, requiring a greater length of time or may be prevented altogether. In the mixture given the plaster of paris has been proportioned to a limited quantity, just enough to make a plaster that will remain firm and compact upon the surface of the glass plate and offer the least resistance to the expansion of the pitting substance to form the pit.

The pitting of lump lime is influenced by the length of time it is allowed to soak after slacking. Specimens that will pit, if made up with the plaster directly after they have been slacked and floated, will, after soaking for 24 hours, show very much less pitting or none at all, again other specimens may require to be soaked for 48 or even 72 hours before they discontinue to show pitting, but the greater number of tests have shown that 24 hours' soaking is sufficient to reduce the pitting to almost nothing. After the plaster upon the glass plates has been exposed to the air, the pitting can generally be seen to develop after one week's exposure and continue for a longer time, but it is better to allow an exposure for several months to be positive of all pitting effect being absent.

In applying the test to hydrated lime, $\frac{3}{8}$ ounce of the hydrated lime is mixed with $\frac{1}{8}$ ounce of plaster of paris and wetted with water to a soft putty to allow the spreading upon the surface of a glass plate to a layer of a depth of about $\frac{1}{8}$ inch, and then left exposed to the air.

Magnesian lime shows less pitting than high calcium lime. The temperature required to burn magnesian lime being lower, under ordinary conditions it does not reach the heat at which lime fuses with iron oxide, alumina or silica, to form the clinker which causes the pitting. When magnesian lime contains pitting substance, it is in part magnesia oxide which remains unchanged on exposure to air, and as it makes an inactive diluent for the calcium oxide (lime), it reduces the expansive force of the enclosed lime in the clinker developed during the slow air slacking, during which the lime swells, in proportion to the magnesia oxide mixed with the lime, and with larger proportions of magnesia oxide, the pitting may not develop at all.

PROPORTIONING CONCRETE.

(Continued from Page 39.)

which not only prevented the paper being presented on the original date, but prevented also the inclusion of specific gravity, water resistance, and fire resistance tests. The series involve 216 test pieces, to which must be added others prepared for water and fire resistance and specific gravity tests, but which could not be tested in the time available. The voids were measured in a patent apparatus designed by Mr. Davenport, which gives results to one-fifth of 1 per cent, and which was found to be independent of the observer. The preliminary data comprised tests on Portland cement, size of granite chips, volume of chips per batch, percentage volume of voids in chips, sizes of river sand used, volume of sand used per batch, percentage volume of voids in sand, and the volume of cement used per batch. Regarding the latter item, it must be noted that no allowance was made for the excess cement required for jointing, only the amount required to fill the voids being used. Had time permitted it, the correct allowance in each case would have been ascertained and additional tests

made therewith. The limited time made it impossible to test the cement before using it for the concreted test pieces, the brand only suggesting its probable good qualities.

The batches were hand mixed by engineering (senior honors) students, and as no special means of testing the thoroughness of the mix were adopted the resulting concrete will probably compare favorably with machine-mixed so far as uniformity of results go. Every care was exercised, however, in the mixing to get all the materials thoroughly intermixed and apparently uniform. This proved to be the case when the specimens were tested. The moulds were made of planed boards, bolted together with gangs, damped before using, and lined with paper on the underside to facilitate removal. In spite of this, several pieces were damaged in removal, due more particularly to the relatively small sections used. Immediately after mixing, the moulds were filled and left in a tool shed till required for testing. They were wetted regularly every three or four days.

It was found that the ratio of compressive to tensile strength varied more in the one-month than the three-month tests, and is not sufficiently uniform to base any conclusions upon beyond the fact that such ratio is not constant. It is considered by the authors, however, that this ratio should be more or less constant, as the failure, whether compressive or tensile, depends upon the adhesive strength of the cement.

The ratios strength at three months to strengthen at one month were more or less uniform, more particularly in the case of compressive strengths. In the case of 1:2:4 concrete the modulus of rupture appears to increase more rapidly than the compressive strength, while in the other series with cement accurately proportioned the compressive strength increases more rapidly than the modulus of rupture, as out of six series only one runs the other way, probably due to rather dry mixing of those three-month test pieces.

Although the cement tests are unsatisfactory, it will be possible to compare the strengths and costs of the concrete in the different series, as they will probably all be affected to the same extent. The most important point brought out by such comparison is the fact that for accurate proportions the cost of cement

ratio— $\frac{\text{total cost}}{\text{total cost}}$ —is practically constant for all gradings taken in the tests, so that when the graded coarse materials are used the total cost need only be further considered. Of course, the total cost is always the final criterion as regards economy, and it may be suggested that the ratio cost of cement to total cost need not be considered. But the relative values of total cost obtained may be altered when additional tests are made at other ages, and it is difficult to say whether they will be affected by the ratio, so that if it can be shown conclusively that this ratio is constant or nearly so the total cost, age, and proportions need only be dealt with.

Five of the larger brick and tile manufacturing and distributing concerns of Seattle, Wash., have organized the Brick & Tile Delivery Co., with headquarters in that city to take over entirely the selling and delivering of the products of the companies interested. Suitable quarters have been secured at the Hoge building and the management has been entrusted to E. A. Strout & Co. A sales manager is to be selected shortly.

F. A. Costello, president of the California Paving Brick Co., San Francisco, Cal., has returned from a business trip to Los Angeles. He reports closing a contract with the city of Oakland, Cal., for supplying 40,000 paving brick on street experiments.

You may find your want in the Bourse.

THE SEWER PIPE BUSINESS.

(Continued from Page 46.)

an average of half a million dollars a year, taking either the twenty-year period or the ten-year period. There is appended herewith the figures for eleven years beginning with 1904 and ending with 1914, which tell the story of the growth of sewer pipe manufacture.

Sewer Pipe Production.

1904	.....\$ 9,187,423
1905	.....10,097,089
1906	.....11,114,967
1907	.....11,482,845
1908	.....11,003,731
1909	.....10,323,324
1910	.....11,428,696
1911	.....11,454,616
1912	.....12,147,677
1913	.....14,872,103
1914	.....14,014,767

These figures are particularly interesting when we take into consideration the fact that concrete has entered sharply into competition with burned clay for sewer making during this period. The competition of concrete has really been divided in this work, part of it being towards sewer pipe proper and part of it being in competition with brick used in constructing the larger sewers. In the sewer pipe varying from twelve inches to thirty-six inches and even forty inches, concrete in some instances has replaced or rather takes the place of lots of burned clay. Of course it has had its run in favor and some reaction, and part of this trade has been regained, but taking it altogether the concrete has undoubtedly cut into the sewer pipe field materially in the larger sizes as well as entered into competition with brick in the still larger sewers.

Now when we consider that notwithstanding this loss of some of the trade to concrete the sewer pipe business has continued to make gains, gains that average half a million dollars a year, it is evident that the use of sewer pipe is increasing somewhere, somehow. A study of the industry shows that the big increase, the thing that has kept the sewer pipe business going even in spite of the inroads made by concrete, is in the demand for smaller sizes, especially of the four and six inch size. This is a direct result of better sanitation and a more extensive use of bathrooms and running water in houses. The increased call for sewer pipe of small size, for drainage, has been the most remarkable feature of the business. These small sizes do not count up into dollars as rapidly as the larger sizes, so when we consider the gains and total value made in the face of competition of cement we can begin to realize something of the wonderful increased call for the smaller sizes in sewer pipe.

It is perhaps safe to prophesy too that this increase in the call for smaller sizes will continue. Quite a lot of the demand heretofore has been for city trade and now the bathroom and running water idea with all that it involves in the way of sewerage is spreading out in the country district, not merely to the smaller towns, but also to the farm houses. So the future of the sewer pipe business looks good, it looks encouraging for still further enlargements, and that it is a branch of the clay working industry that will keep in step and will continue to make a good showing as compared to other lines of clay products.—The Clay Worker.

NEWS OF THE CLAY FIELD.

The Unit Brick & Tile Co., Santa Barbara, Cal., manufacturers of building brick, building stone and ornamental concrete specialties, has ordered additional machinery and will enlarge the capacity of its plant.

The Warrenton Clay Products Co., Warrenton, Ore., among other improvements is building a spur track to connect the company's factory with the railroad.

The market place of the building material industry. Employment department, machinery wanted and for sale, etc. If your wants are not answered in this page, write a letter to this office.

THE FRANCIS PUBLISHING CO.
537 S. Dearborn Street Chicago, Illinois

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Heading counts as two lines.
No display except the headings can be admitted.

Remittances should accompany the order. No extra charges for copy of paper containing the advertisement.

EMPLOYMENT WANTED

WANTED—Position as operating superintendent. A number of years' experience erecting crushing plants and operating stone quarries. Would operate on a percentage. Am at present employed. Address Box 1131, care ROCK PRODUCTS AND BUILDING MATERIALS.

EMPLOYEES WANTED

WANTED—An experienced quarry superintendent familiar with manufacture of granite paving blocks and the operation of gyratory crushing plant. Salary \$150.00 a month to start, and more if worth it. State age, experience and how soon you could start. Address Box 1130, care ROCK PRODUCTS AND BUILDING MATERIALS.

WANTED AT ONCE

A barrel maker: steel hoops used. Steady work. **AMERICAN LIME & STONE CO.**, Tyrone, Pa.

WANTED—Reliable and competent party to quarry and crush stone by the ton in plant installed and in good condition. Address Box 1133, care ROCK PRODUCTS AND BUILDING MATERIALS.

MACHINERY WANTED

WANTED—A rotary sand-lime brick press twelve mold Saginaw press preferred. State condition, price and location. Address Box 1129, care ROCK PRODUCTS AND BUILDING MATERIALS.

WANTED—A No. 6 Austin or Gates Gyratory Crusher in good condition. The Henderson Farmers' Lime Co., Woodstock, Ont.

WANTED TO BUY—One 100-T or larger second hand steam shovel. Must be in first class condition. Address The Western States Portland Cement Co., Independence, Kansas.

WANTED

2d Hand Grinding Machinery

Griffin Mills preferred

State make and price. Address Box 1122, care Rock Products & Building Materials.

WANTED

Slack line excavators, 600 ft. radius; Gravity Return Jigs, Log Washers, Screens, Picking Belts, Light Stand. Gauge Saddle Tank Locomotive.

MANGANESE PRODUCTS COMPANY

35 Wall St., New York, N. Y.

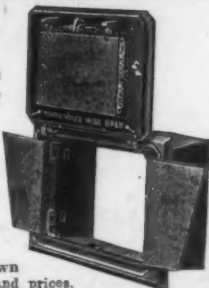
Marvel Chutes

Stand for Protection Strength & Longevity

—See the large door and wings protecting the siding and foundation from coal damage when open. Automatic lock—burglar proof when closed. Heavy gray iron frames give unlimited strength. Once installed will last a lifetime.

We want an agent in each town. Write for leaflet "R" and prices.

INTERSTATE MFG. CO., Oskaloosa, Ia.



PLANTS FOR SALE

LIME PLANT FOR SALE

With all necessary buildings, two crushers, lime grinding machine (6) kilns capacity of 1,800 bushels per day. Plant in full operation, centrally located, fully equipped. Splendid crushed stone business. Two railroads by the plant, making shipping facilities the best. The property contains 37 acres of land underlaid with an inexhaustible supply of lime and building stone. A splendid opportunity to make big returns on the investment. Reason for selling, advanced age and ill health. Address Box 425, Frederick, Md.

FOR SALE.

Stone Quarry Plant near Columbia, South Carolina. Good climate the year around. Plant fully equipped and now operating. Good opportunity for someone. Present owners unable to give proposition the necessary attention. Address Box 1126, care ROCK PRODUCTS AND BUILDING MATERIALS.

FOR SALE

Crushed stone plant, 50 miles from Chicago, at a sacrifice. One No. 7½, two No. 5 and one No. 4. Thirteen acres of good quarry land. Good shipping facilities, three railroads. Plant now in operation. Demand greater than the supply. Address J. H. D., care ROCK PRODUCTS AND BUILDING MATERIALS.

BUSINESS OPPORTUNITIES

FOR SALE—Good sand and gravel farm thirty-five miles from Chicago. Splendid shipping facilities. Address A. M. Walter, 384 St. Charles St., Elgin, Ill.

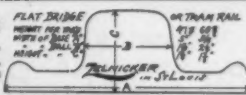
"RAILS"

All sections of new and relay rails in first-class condition. Splice Bars, Frogs, Switches and Spikes also carried in stock. We purchase abandoned plants and cheerfully quote prices on any material that you may have to dispose of.

M. E. FRANK, Frick Bldg., Pittsburgh, Pa.

Flat Steel Rails

Just the thing for runways and around quarries. Low prices on all weights relaying rails.



ZELNICKER IN ST. LOUIS

423 First National Bank Building, Chicago
910 Hennen Bldg., New Orleans, La.

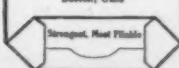
QUARRYMEN

We have many bargains in high-grade "used" Steam Shovels, Locomotives, Cars, Cranes, Cableways, Crushers, Air Compressors, Hoists, etc. What do you need?

WM. B. GRIMSHAW COMPANY
693 Drexel Building Philadelphia, Pa.

Paper Bags of Quality.

For All Purposes
The Jaito Company
Boston, Ohio



MACHINERY FOR SALE

FOR SALE.

One 5-ft.x22-ft. Bonnot tube mill, steel lining.
One 5-ft.x22-ft. Bonnot tube mill, wood block lining.
One 4-ft.x16-ft. Schmidt tube mill, silax lining.
One Bonnot stone separator.
One 42-in. Sturtevant Underrunner emery mill.
Three 6-in.x5-in. Bonnot slurry pumps.
Two 5-in.x4-in. Bonnot slurry pumps.
One 250 H.P. Hamilton Corliss Engine.
One six ton Byers geared locomotive.
Twenty K & J two-way dump cars, three yard capacity.
One 60-ft.x16-ft.x5-ft. dredge boat, 5-in. slides and ends, bolted.
All in good condition and ready for delivery.
Charles F. O'Donnell, Bellefontaine, Ohio.

FOR SALE.

1 Hamilton-Corliss Engine, 24"x48".
1 Bullock-Corliss Engine 20"x48".
1 Ingersoll Sergeant Duplex Steam Driven Compound Air Compressor, Class G-2, capacity 925 cubic feet free air per minute.
48" gauge and 36" gauge locomotives and cars, end and side dump.
Above equipment in good condition and will make extremely low prices for immediate sale. Address The Casparis Stone Company, Columbus, Ohio.

FOR SALE—CHEAP.

1 New 100-C Bucyrus steam shovel, complete with 4 yd. dipper, 85-lb. rail sections and extra hoisting chain. Perfect condition.
1 Standard gauge, 50 ton, 6 wheel switcher locomotive, 20x24 cylinders, first class condition. Address Box 1127, care ROCK PRODUCTS AND BUILDING MATERIALS.

THE BEAL CORE DRILL.

The best, cheapest and most effective for testing all kinds of rock and mineral lands. Core taken out 3 and 4 inches in diameter. Estimates furnished. **EDW. S. BEAL, 214 Woodlawn Ave., Lansing, Mich.**

FIRST CHECK FOR \$300 BUYS THREE SELF-DUMPING AND SPREADING 3 CUB. YARD ACME TRACTION HAUL WAGONS ONLY BEEN USED 3 MONTHS. FIRST CLASS CONDITION. LEESBURG LIME CO., INC., LEESBURG, VA.

FOR SALE—1 22½"x14½"x14" Ingersoll-Rand Class "JC" Air Compressor—No. 8130-H.P. and 8131-L.P. complete. This machine is for all practical purposes, good as new, having been in actual service less than two years. **RACINE STONE COMPANY, Corn Exchange Building, Chicago.**

FOR SALE—18" Bonnot pulverizer practically as good as new. Operated only about three weeks. Address **United States Glass Co., Tiffin, Ohio.**

FOR SALE—New No. 3 Newago Separator, style H. Write promptly. Address **F. W. T. Co., care ROCK PRODUCTS AND BUILDING MATERIALS.**

FOR SALE CRUSHERS, LOCOMOTIVES, CARS, STEAM SHOVELS, ETC.

C. G. A. SCHMIDT, Jr.
639 Land Title Bldg. Philadelphia, Pa.

FOR SALE

100-C Bucyrus steam shovel.
20x24 6-wheel switcher.
12 yd. Western dump cars.
Baby Giant traction shovel.
2 hoisting engines.
Stiff leg and guy line derricks.
10 H. P. portable boiler.
Cook deep well pump.
No. 0 Cyclone drill.

Write for particulars.

Address Box 1132, care ROCK PRODUCTS & BUILDING MATERIALS.

FOR SALE—At a Bargain

One No. 00 Raymond Impact Pulverizer.
One No. 12 Smidth Tube Mill.
NATIONAL RETARDER CO.
930 N. Halsted Street Chicago, Illinois

ADVERTISE ON THIS PAGE FOR YOUR REQUIREMENTS

We Wish to Call Your Attention to the advantages of **THE BOURSE**, which is devoted to the buying and selling of second hand machinery and filling all other requirements where display advertising is not necessary.

GIVE IT A TRIAL

SOLD TO DEALERS ONLY



We offer **THE DEALER**
CALVERT MORTAR COLORS
For Their True Worth
to the owner, the builder and himself
by the only makers
CALVERT MORTAR COLOR WORKS
Dept. R, Warner & Wooster Sts., BALTIMORE, MD.

Anchor Brand Colors

For Mortar, Cement and Brick
Brown, Black, Red and Buff
Strongest and Most Durable

Manufactured
by **C. K. Williams & Co.**
Correspondence Solicited **Easton, Pa., U. S. A.**



Stained with Cabot's Shingle Stains and lined with Cabot's Sheathing Quilt. Robert W. Spencer, Jr., Architect, Chicago.

Cabot's Building Specialties

Creosote Stains on Shingles, Siding, Clapboards, Trimming Boards, and all other Exterior Woodwork.
Waterproof Cement and Brick Stains for waterproofing and artistically coloring cement and brick buildings.
"Quilt" for lining houses to keep out cold or heat, for sound-deadening in floors and partitions, and for insulating cold storage and refrigerators.
Conserve Wood Preservative for preserving Posts, Planks, Sills and all other exposed timbers. Mortar Colors, Protective Paints and Metals, Waterproofing Compounds, etc.

SAMUEL CABOT, Inc., Mfg. Chemists
BOSTON, MASS., U. S. A.
1133 Broadway, New York 24 West Kinzie St., Chicago

"Winners"

Thousands of the country's leaders in concrete work have said, "Send me the Concrete Dope Book."

They know that the makers of **WINNER MIXERS** would not advertise it as a valuable book if it did not contain just the sort of concentrated information and data that the man of concrete affairs needs.

You will find the Concrete Dope Book different, just as you will find Winner Mixers different. Sound, common sense fills the pages of the Dope Book, and sound, mechanical construction and merit is built into Winner Mixers.

You need them both—but be sure and get the Dope Book—It's Free—and then we will talk about Winner Mixers later.

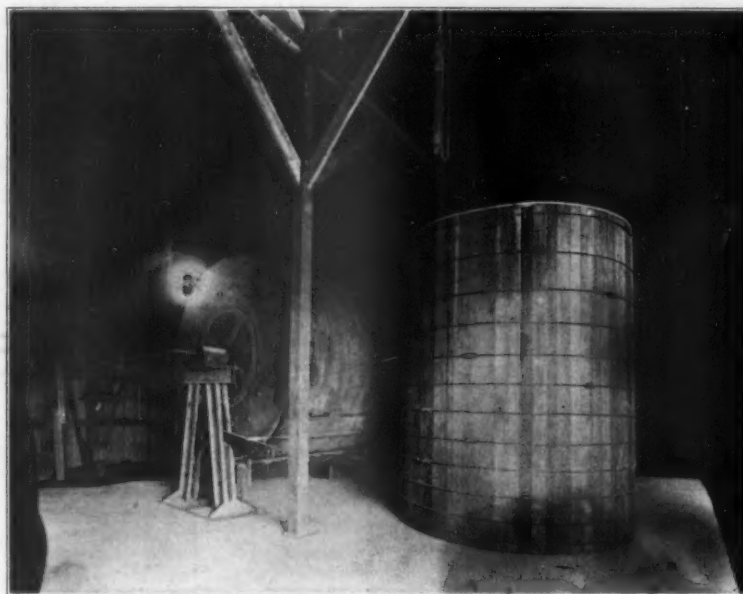
The Cement Tile Machinery Co.
457 Rath Street Waterloo, Iowa

I want the "Dope Book"

Name
Address
.....

Perfection

in product and manufacturing processes our aim; special equipment has been designed and built to carry out this idea.



Cylindrical Dryer, capacity 3 tons per hour, and Blending Tank, capacity 30 tons. Installed at Port Clinton, Ohio, plant.

The National Retarder Company 930 North Halsted St. **Chicago, Illinois**

Mills at Port Clinton, Ohio, Webster City, Iowa

Tell 'em you saw it in **ROCK PRODUCTS AND BUILDING MATERIALS**

WHITEHALL

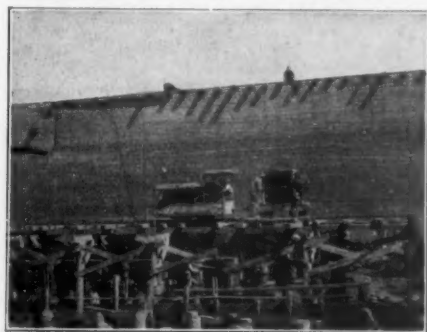
PORTLAND CEMENT

Whitehall Cement Manufacturing Co.

**1722 Land Title Bldg.
Philadelphia**

Plymouth Gasoline Locomotive Breaks World's Concreting Record On U. S. Dam Work

The Ohio River Contract Co., of Evansville, Ind., not only has broken all the concreting records on the longest movable dam in the world (No. 48 Ohio River), but it has cut them in half, by placing 9,810 cubic yards in 269 hours, including all delays, and at the same time saving \$44 in cost every 8 hours.



HERE'S WHAT SECRETARY EICHEL SAYS: "These two 'Plymouths' supplanted 12 mules on this work and each saved us \$22 in costs every 8 hours," says Mr. Eichel. "The 80-ton hauler cost \$20,000, and the 10-ton hauler cost \$9,076.10, which is a record in itself. They operated a maximum round trip of 1,600 feet, with stop for loading at mixer and dumping material. Average time for each 'Plymouth' was 4 minutes, day and night, for 22 days, including all delays."

Plymouth Locomotives Do Wonders in All Sorts of Duties

On construction work—in road building—in mines—in gravel pits—in brickyards—and wherever haulage between two fixed points is a problem. Plymouth Locomotives are working low-cost miracles every day.

READ EICHEL'S FULL STORY—IT'S FREE TO YOU. We have a complete record of the concreting work done at Dam No. 48, which was supplied by the Chief Engineer and written by Mr. Eichel himself. It is full of interesting figures for contractors and will be mailed to anyone requesting it. A postcard will bring it.

THE J. D. FATE CO., 210 Riggs Avenue, Plymouth, Ohio



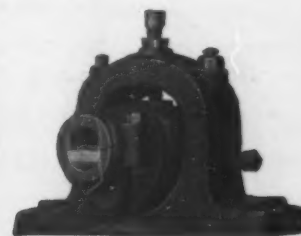
ELEVATING AND CONVEYING MACHINERY



H. W. CALDWELL & SON CO.

17th St. and Western Ave., Chicago
Hudson Terminal, 50 Church St., New York

711 Main Street, Dallas



ROCK PRODUCTS and BUILDING MATERIALS

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Tell 'em you saw it in ROCK PRODUCTS AND BUILDING MATERIALS

EXPANDED CUP
**SYKES SELF FURRING
METAL LATH**

Saves 5 to 10 Cents a Sq. Yd.

FOR Interior Work as well as for Stucco Work Sykes Expanded Cup Metal Lath is best, not only because it saves the cost of furring strips but also because of its WEIGHT, its perfect KEY—the rigidity and durability of the wall it assures.

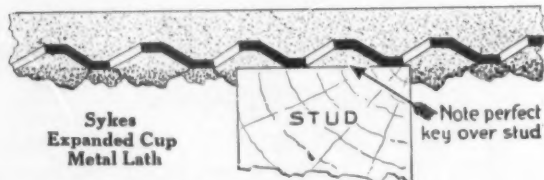
SYKES

Expanded Cup

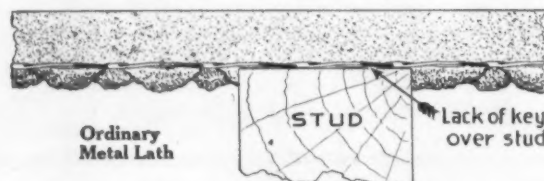
METAL LATH—Self Furring

This Metal Lath is heavier than others, therefore more rigid, more durable. Its peculiar formation allows it to reinforce the wall more surely—for this lath is imbedded in the mortar $\frac{1}{4}$ inch.

Note this cut:



Now look at this cut:



The point of weakness is over the stud where the mortar gets no "grip." Less mortar is required when you use Sykes, because—all grounds being measured from face of stud not from face of lath—the key mortar in Sykes Lath is largely in the wall.

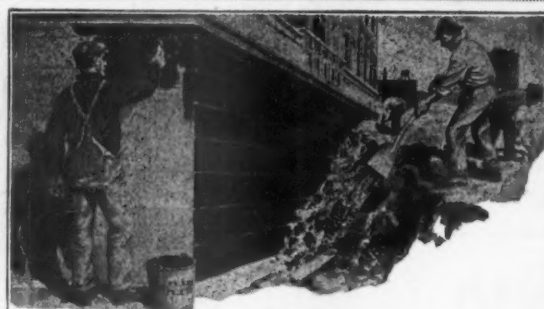
For an Honest, Durable Job Use the Lath that Makes a Real Backbone of Lasting Strength—Sykes Expanded Cup Metal Lath.

Approved by U. S. Government for Post Office Work. Indorsed by Architects and Contractors.

Free Booklet—Metal Lath Specifications—and free sample of Sykes Metal Lath on request



**Sykes Metal Lath and
Roofing Company**
508 River Road, Warren, Ohio



*"This cellar is
sure to be dry"*

There will be no trouble here from dampness getting into the cellar-wall. I am applying

R.I.W. MARINE CEMENT
REMEMBER ITS WATERPROOF
REG. U.S. PAT. OFF.

R. I. W. Marine Cement is applied from footings to grade level of brick, stone and concrete foundation walls. Very successfully used on the McKinley Memorial Monument at Canton, Ohio and other important structures. When wood floors are to be laid over cinder concrete, the sleepers and under side of the flooring should be coated with R. I. W. Trimbak, followed by R. I. W. Marine Cement over the entire floor area including sleepers. Applied cold with a brush or swab.

Write Dept. 12 for a copy of the Red Book.

TOCH BROTHERS

Established 1848

Inventors and Manufacturers of R. I. W. Preservative Paints, Compounds, Enamels, etc.

320 Fifth Avenue, New York

Works: New York, London, England and Toronto, Ont., Canada.

*Toch
Dealers
are
making
money!*

Be a Toch Dealer With ads like the above running in forty national and trade magazines a Toch Agency is a most profitable connection. If you are well established in the building material or hardware business, let us hear from you. Address Dept. 12.

PLYMOUTH GYPSUM CO.

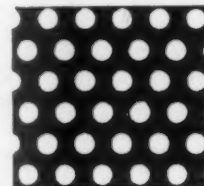
FORT DODGE, IOWA

Manufacture what is known as **QUALITY BRANDS**
ORDER A CAR AND BE CONVINCED

Plymouth Plaster and Finishes White Sand Float Finish
Plymouth Wood Fibre Plaster Best Bros. Keene's Cement
Acolite Cement Plaster Sackett Plaster Board
(the long keeper)
Exterior Plaster Tiger Brand Hydrated Lime
Fireproof Gypsum Partition Tile

Write for advertising matter and prices

BRANCH OFFICES: {1015 Lumber Exchange, Minneapolis
{5040 St. Lawrence Ave., Chicago



"HENDRICK"
PERFORATED STEEL SCREENS AND
ELEVATOR BUCKETS

—STAND THE TEST—

Let us figure on your requirements.

HENDRICK MFG. CO.
New York Office, 30 Church St. CARBONDALE, PA.

Tell 'em you saw it in ROCK PRODUCTS AND BUILDING MATERIALS

Northwestern Portland Cement



The Reliable Portland Cement

A Portland Cement for the

NORTHWEST

NORTHWESTERN STATES PORTLAND CEMENT COMPANY

MASON CITY, IOWA

Concrete for Permanence "Wolverine" for Concrete

Wherever used "Wolverine" has always given the highest satisfaction

WOLVERINE PORTLAND CEMENT CO.
COLDWATER, MICH.

Write for prices and information. W. E. COBEAN, Gen. Sales Agt.

CAROLINA PORTLAND CEMENT COMPANY

We are the largest distributors of Portland Cement, Lime Plaster, Fire-brick and General Building Material in the Southern States, and have stocks of Standard Brands at all of the Atlantic and Gulf Seaports, and at our interior mills and warehouses, for prompt and economical distribution to all Southern territory. Write for our delivered prices anywhere.

Also Southern agents for the "Dehydratine" waterproofing material. "Universal," "Acme" and "Electroid" Brands Ready Roofing.

GET OUR PRICES

CHARLESTON, S. C.
ATLANTA, GA.

BIRMINGHAM, ALA.
NEW ORLEANS, LA.

Here's your guarantee for Portland Cement

that you can depend on

Look for the bag



with the zig-zag tag

It's the distinguishing mark of

Marquette

Portland Cement

As lasting as the pyramids

Marquette Cement Mfg. Company
Chicago, Illinois

WHEN YOU ABSOLUTELY KNOW THAT

Ricketson's Mortar Colors

are pure and brilliant in tone, economical in application and a permanent guarantee against fading and washing

Why not INSIST on having them?

They are the acknowledged best for all uses—Mortar, Brick, Cement Concrete and stone. Red, Brown, Buff, Purple and Black.



RICKETSON MINERAL PAINT WORKS, MILWAUKEE, WIS.

DEALER COOPERATION + DEALER COOPERATION + DEALER COOPERATION + DEALER COOPERATION

GORDON COATING



FOR SURFACES of Cement, Stucco, Brick, etc.

Through our years of experience in the paint business, we have developed a coating for surfaces which is unsurpassed.

Gordon Coating is manufactured in white and eight shades.

This is a dealers' proposition. Write to-day for our interesting offer.

GORDON - HITTL CO., 85 Purchase St., BOSTON, MASS.

DEALER COOPERATION + DEALER COOPERATION + DEALER COOPERATION + DEALER COOPERATION

Tell 'em you saw it in ROCK PRODUCTS AND BUILDING MATERIALS

BANNER HYDRATE LIME

*Carries more sand for Mason Work,
than any other lime on the market*

FOR INFORMATION APPLY TO THE

NATIONAL MORTAR & SUPPLY COMPANY

A. H. Lauman, President

PITTSBURGH, PA.



**IF IT IS
LIME
WE MAKE IT**
(STRONGEST IN OHIO)

BULK and Barreled -:- "MASON'S HYDRATE"—For Brick-work, plastering and masonry. -:- "LIME FLOUR"—Hydrated Finishing Lime—Best on the Market. -:- "CLOVER GROWER"—Land restorer, for the farmer—none better. -:- "CARBO HYDRATE"—Soil sweetener—crop producer. -:- Prompt shipments. -:- A dealer wanted in every town. -:- **WRITE OR PHONE FOR PRICES.**

The Scioto Lime and Stone Co.
Delaware, Ohio



DIME SAVINGS BANK,
DETROIT, MICH.
McNulty Brothers,
Plastering Contractors.

A Million Dollars

Is not spent carelessly. That is why all the walls of this finest of Michigan buildings are finished with

"Lion Brand
Rock
Wall Finish"
Hydrated Lime.

Write us

**Ohio and
Western
Lime Co.**
Huntington, Indiana

*The Largest
Producers
of Ohio and
Indiana
Lime*



A Northwestern Ohio Finishing Hydrate

If you are unacquainted with this product one trial will convince you of its many good qualities, among which are its fineness (air separated), its whiteness and purity.

Monarch Hydrate
is guaranteed

Write us for prices and information

The National Lime & Stone Co.
CAREY, OHIO

Tell 'em you saw it in ROCK PRODUCTS AND BUILDING MATERIALS



THE RICHLAND COUNTY COURT HOUSE at Olney, Illinois

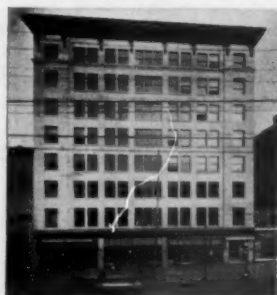
The architect was J. W. Gaddis, of Vincennes, Indiana. The general contractor was VanHoy & Son, of Logansport, Indiana. The concrete walks around the building were laid by E. F. Glasgow, of Olney, Illinois. The lime was furnished by Jno. D. Hurn & Son, Olney, Illinois.

THE bricks of this structure were laid up in MITCHELL HYDRATED LIME mortar. An automatic mixer was used to make an intimate mix, for sand particles completely coated insure a thorough and uniform mortar, easily spread and ultimately forming a stronger bond. With hydrated lime, slaking is entirely eliminated as well as the delay and inconvenience of slaking boxes to run off mortar.

Another feature of this work was the use of MITCHELL HYDRATED LIME in the concrete walks. The addition of the hydrated lime made the concrete work more easily and smoothly and the finishing coat presents a much lighter color. The lighter appearing walks are attractively set off by contrast with the beautiful green lawns and parkway.

Write us for additional and interesting facts on hydrated lime for mortar and concrete.

MITCHELL LIME COMPANY, Mitchell, Indiana



Canadian Dealers Sell Ohio Lime

Canada is a great lime producing country, but dealers over there sell tons of

Tiger Brand White Rock Finish Hydrated Lime

There can be but one reason for this.

Tiger Brand sells more quickly, gives better satisfaction to customers and better profit to the dealer.

If Canadian dealers can make money on it, you surely can.

THE KELLEY ISLAND LIME & TRANSPORT CO.
CLEVELAND, OHIO



CWG PRODUCTS

Floor Hardener
Damp-proof Plaster Bond
Damp-proof Coating
Stone Backing
Ceresitol

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Send for literature,
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Ceresit Waterproofing Co.
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Red, Brown, Buff and Black



MORTAR COLORS



The Strongest and
Most Economical
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Our Metallic Paints and Mortar Colors are unsurpassed in strength, fineness, and body, durability, covering power and permanency of color. Write for samples and quotations.

CHATTANOOGA PAINT CO.
Chattanooga, Tennessee

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Move Your Products With a "Railroad" of Your Own Rapidly and Economically

While the Federal is not a railroad in the literal sense of the word (because it is unlimited by rails) it fulfills all the functions of a railroad for distances within half a day's run.

Loaded right at your place it speeds your products and materials right up to the spot where they are needed one mile or thirty miles away.

During a recent twenty-seven day period a 3 1/2 Ton Federal No. 5172 handled loads aggregating 1,327,411 pounds, making 211 trips and traveling 750 miles.

The Federal Truck is "built for the road" and is right there with the tonnage and mileage when put to the test in the daily service of business firms. We have interesting data concerning Federals in the building materials business—have us send it to you.

"Traffic News," published each month in the interest of economical transportation, will be mailed you regularly upon request.

1 1/2, 2, and 3 1/2 Ton Worm Drive Motor Trucks

Federal Motor Truck Company
DETROIT, MICHIGAN

THE BEST BLAST-HOLE DRILL ON EARTH

THE CYCLONE NO. 14

Not a Boast—A FACT

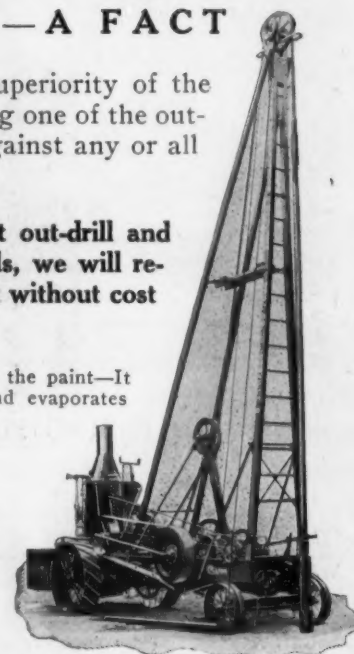
We will prove the superiority of the No. 14 Drill by placing one of the outfits in your quarry against any or all other makes.

If the Cyclone doesn't out-drill and out-wear all other drills, we will remove it from the work without cost to you.

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Particulars



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an adaptation of the single feed principle to a Two Tube Packer for Pulverized Limestone and similar Rock Products.

You can pack Limestone with this machine for Ten Cents a ton.

LET US
HEAR FROM YOU



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Macadam Roads That Do Not Bleed in Hot Weather

Do Not Ravel with Traffic, and Maintain a Hard, Compact Surface



View of Road, Goshen Township, Mahoning Co., Ohio.
Constructed 1913. Photograph Nov., 1915.

Glutrin Bound Roads

should be advocated by every producer of stone, slag or gravel in the construction of macadam roads, because they mean a bigger volume and a bigger profit.

Your cooperation is cordially desired.



GLUTRIN.

Glutrin Road Binder

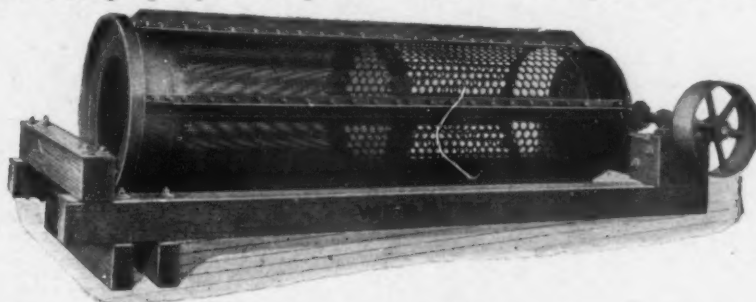
is the simplest surfacing process known. The liquid binder material is applied from an ordinary water sprinkler. The roller follows the sprinkler in the usual way, resulting in the road surface that gives the biggest service for first cost.

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We design and manufacture complete elevating, conveying, screening and power transmission equipments for crushed-stone, sand and gravel, lime and cement plants.

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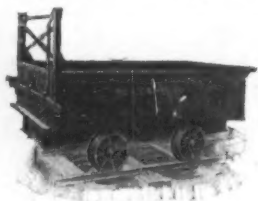
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Lime Hydrators, Kilns, Calcining and Quarry Cars



No. 274
End Dump Quarry Car.

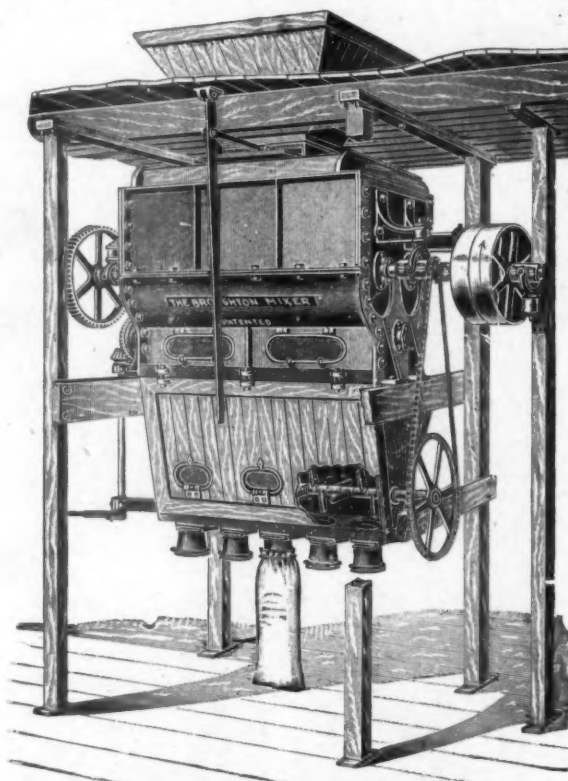


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Also made in end dump. Above
car made for loading with
steam shovel.

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